

BLUE BOOK
Scully Steel & Iron Co.
Chicago - New York
1910



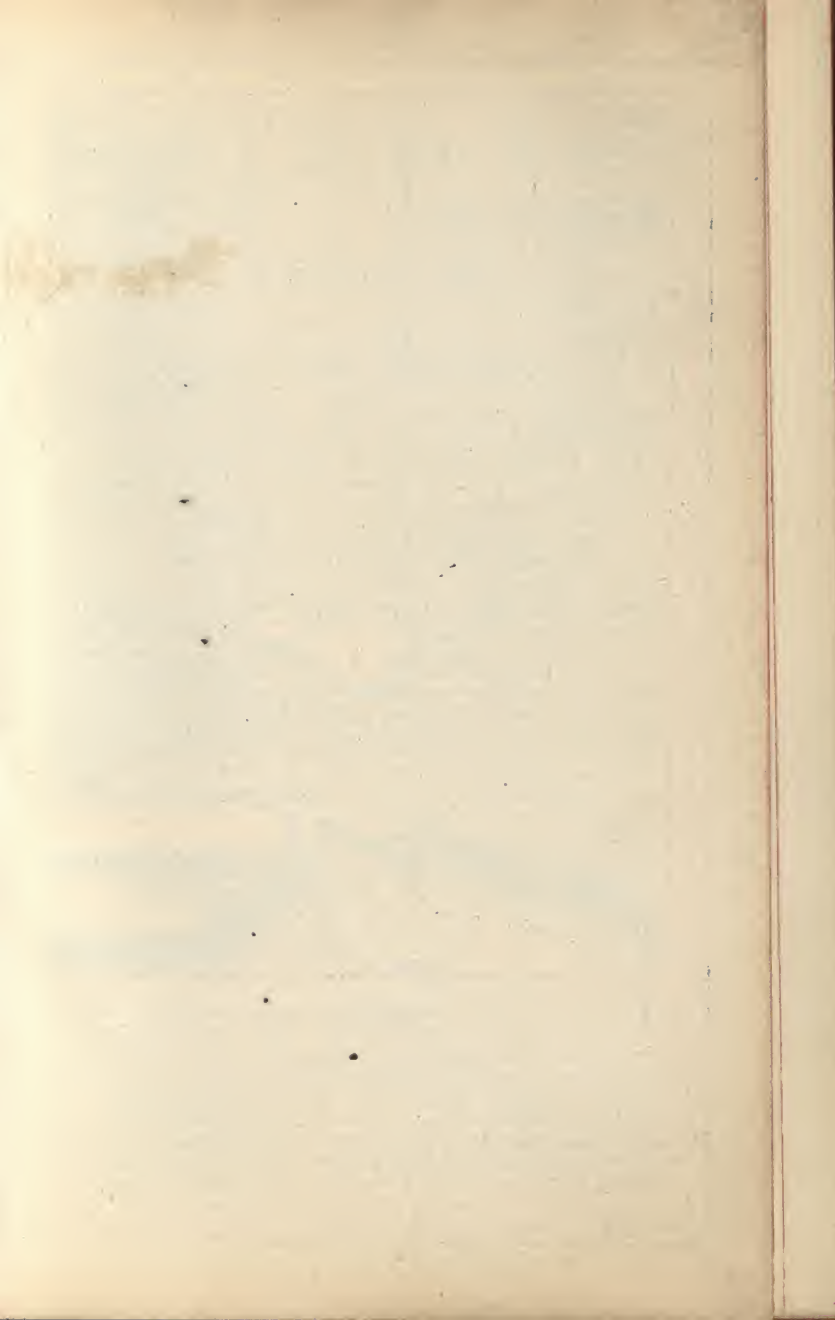
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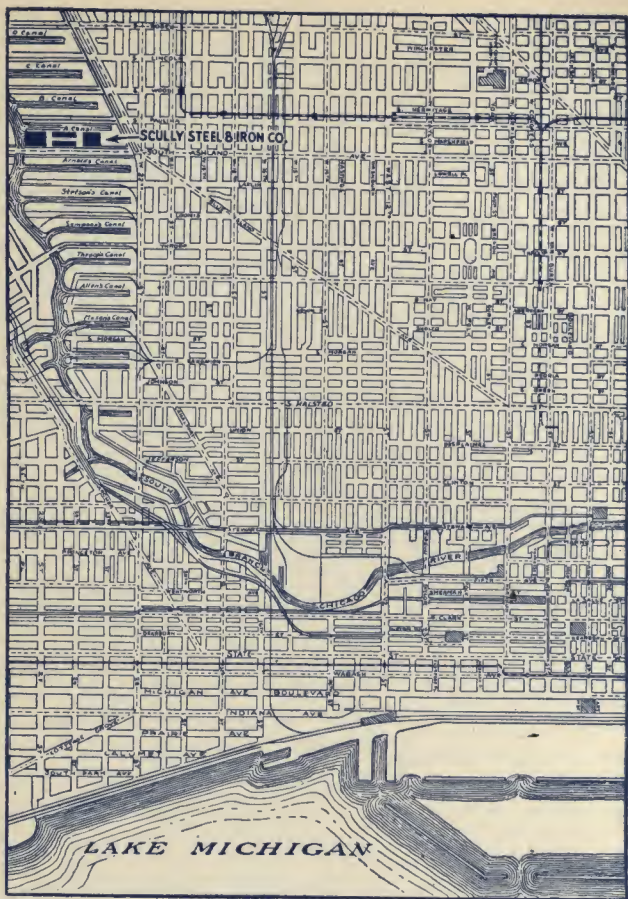
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OUR new General Offices and Warehouses are located on Ashland Avenue from 23d to 26th Streets. May be reached from downtown by taking Blue Island Ave., Ogden Ave., Lake St., Madison St., Harrison St., Taylor St. or Twelfth St. cars and transferring to Ashland Ave. cars, which pass our doors. ¶ Our down-town office is in the First National Bank Bldg., corner Dearborn and Monroe Sts., and for the convenience of our customers we will maintain automobile service between the two offices. ¶ Our customers and friends are cordially invited to pay us a visit and inspect our new warehouses.

SCULLY STEEL & IRON COMPANY

Scully Blue Book

Catalogue of

Iron, Steel, Machinery,
Heavy Hardware,
Tools and Supplies, with
Valuable and Accurate
Reference Tables

1910

Scully Steel & Iron Co.
Chicago

District Sales Offices

EASTERN OFFICE,	- -	U. S. Express Bldg.	NEW YORK
MILWAUKEE OFFICE,	- - -	212 Stephenson Bldg.	
NORTHERN OFFICE,	-	433 Andrus Bldg.	MINNEAPOLIS
WESTERN OFFICE,	-	408 Boston Bldg.	DENVER, COLO.
LOS ANGELES, CAL.	- - - -	104 Stimson Block	

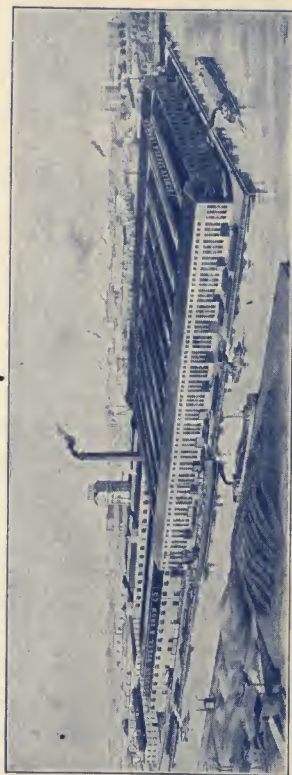
NOTICE

THIS 1910 Scully Blue Book is our complete catalog for this year. We invite attention to the completeness of our line of iron, steel, heavy hardware, tools, supplies and machinery, and hope that this list of stock, with the tables of weights and other information, will induce you to keep this book on your desk for use as your reference book during the year.

We will continue the publication of our monthly stock list, showing the amount of stock on hand at the beginning of each month, but the monthly issue will in no way take the place of this catalog. We want you to keep the Blue Book and use it.



**NEW WAREHOUSES AND GENERAL OFFICES
SCULLY STEEL & IRON CO., CHICAGO.**



**Large Steel Warehouse, 250 ft. x 650 ft.
Sheet Steel Warehouse, 100 ft. x 300 ft.
Hardware Building, 100 ft. x 300 ft.**

**General Offices, 100 ft. x 300 ft.
Machinery Warehouses, 80 ft. x 200 ft.
Rivet and Miscell. Whse., 100 ft. x 250 ft.**

INDEX.

	PAGE		PAGE
ANGLES.....	38	CLAMPS, Boilermakers'	112
ANVILS.....	142	CLAW BARS.....	148
ARCHES, Corrugated.....	28	CLEANERS, Flue.....	111
ARMATURE ANTI-FRICTION METAL	88	CLIPPERS, Bolt.....	142
ARMATURE STEEL.....	27	COLD ROLLED STEEL (BARS).....	52-53
BABBITT METAL.....	88	CORRUGATED ARCHES.....	28
BANDS AND HOOPS.....	46-47	CORRUGATED STEEL.....	28
BARS, CONCRETE CONSTRUCTION.....	17	COTTERS, Spring.....	77
Merchant Iron.....	58-59-60	COUNTERSINKS.....	137
Mild Steel.....	42-43-44-45	COUPLING, Hose, Scully.....	208
Norway and Swedish.....	62-63	COUPLINGS.....	123
Sleigh Shoe Steel.....	50	CRABS, Man-Hole.....	94
Smooth Finish Open Hearth		CRAYONS, Soapstone.....	89
Machinery Steel.....	50	CROW BARS.....	148
Staybolt Iron.....	61	CUTTERS, Flue.....	106-107-108
Tire Steel.....	48	Flue-Hole.....	110
BEADED STEEL.....	28	Pipe.....	109
BEAMS, Steel "I".....	37	DIES.....	123
BEARING METAL.....	88	DRAWING STEEL.....	27
BEEF RAIL, PACKING HOUSE.....	49	DRIFT BOLTS.....	84
BEVEL EDGE STEEL.....	49	DRILLS, Breast.....	128
BLOWERS.....	156	Chuck.....	132
BOAT SPIKES.....	84	Flat.....	129-136
BOILERS, Sizes carried in stock	302-303	Ratchet.....	127
BOILER HEADS, ETC.....	12-13-14-15	Sleeves.....	130
Bolts.....	70	Sockets.....	115-126-131-133
Braces.....	92-93	Stand for.....	133
Nozzles.....	98	Track.....	149
Rivets.....	32	Twist.....	129-130-131-132
Taps.....	136	ELECTRICAL STEEL.....	27
Tubes.....	30	ELEVATOR BOLTS.....	71
BOILERMAKERS' HAMMERS AND		EXPANDERS, Flue.....	104-105
TOOLS.....	115-116-117	EXPANSION BOLT.....	70
BOLT CLIPPERS.....	142	EXPANSION SHIELD.....	70
Ends.....	69	FERRULES, Copper.....	95
BOLTS, BELT OR ELEVATOR.....	71	FILES AND RASPS.....	138-139
Boiler.....	70	Handles.....	121
Boiler Staybolts.....	90	FIRE BOX STEEL.....	8
Carriage.....	67	FLANGES, Forged Steel.....	96-97
Drift.....	84	FLANGE STEEL PLATE.....	10-11
Expansion.....	70	FLANGING AND DISHING HEADS.....	14-15
Hand-Hole.....	70	FLARING TOOL.....	114
Machine.....	66	FLOOR PLATES, Wrought Steel.....	20-21
Man-Hole.....	70	Universal Safety Tread.....	22-23
Patch.....	90	FLUE CLEANERS.....	111
Plow.....	69	Cutter.....	106-107-108
Sieve.....	68	Expanders.....	104-105
Stud.....	71	Hole Cutter.....	110
Track.....	85	Plugs.....	89
BONE CRUSHER STEEL.....	50	FLUES, Iron, Seamless and Steel.....	30-31
BRACES, Boiler.....	92-93	FORGES.....	156-157
BREAST DRILLS.....	128	FUSIBLE PLUGS.....	89
BRICK SIDING.....	28	GALVANIZED SHEET STEEL.....	26
BUCK STAYS.....	95	GAUGES, Track.....	148
CAP SCREWS.....	73	GRINDING WHEELS, NORTON.....	141
CARRIAGE BOLTS.....	67	HACK SAW FRAMES AND BLADES.....	140
CASTERS, Ball-Bearing.....	113	HAMMERS AND BOILERMAKERS'	
CHAIN HOISTS.....	152-153-154-155	HAND TOOLS.....	116-117
CHAINS.....	86-87	HAMMERS, Handled.....	118
CHANNELS.....	37-39	Pneumatic, Tools for.....	114-115
Price List Extras.....	36	HANDLES, File.....	121
CHARCOAL IRON BOILER PLATE.....	11	Hammer.....	120-121
CHISELS, For Pneumatic Hammers.....	115		
CHUCK, Stay-Bolt.....	114		
Drill.....	132		

MACHINERY INDEX ON PAGE 7.
INDEX OF TABLES, ETC., ON PAGE 6.

INDEX—Continued.

	PAGE		PAGE
HAND-HOLE BOLTS.....	70	RIVETS, Boiler.....	32
HANGERS, Boiler.....	94	Pound.....	34
HEADS, Boiler.....	12-13-14-15	Sheet and Tank.....	34-35
Punching, Flanging and		Structural.....	33
Dishing, Prices for.....	14-15	ROLL CAP ROOFING.....	29
HOISTS, Chain.....	152-153-154-155	ROOFING.....	28-29
HOOPS, Steel.....	46-47	SAFETY TREAD.....	22-23
HOSE, Metallic.....	213	SAWS, Hack, and Blades for.....	140
HOSE COUPLING, Scully.....	208	Blades, Stone.....	49
IRON, Merchant.....	58-59-60	SCRAPERS.....	149
Norway.....	62-63	SCREWS, Cap.....	73
Staybolt.....	61	Iron Set.....	72
JACKS.....	150-151	Lag or Coach.....	65
KEYS, Spring.....	77	SCREW PLATES, Boilermakers'.....	112
LAG SCREWS.....	65	SCREW PUNCHES, Boilermakers.....	122
LOCOMOTIVE JACKET STEEL.....	27	SEWER RODS.....	49
LUGS, Boiler.....	94	SHAFTING, Bevel Edge Shaft Steel.....	49
Tank.....	75	Cold Drawn and Turned Steel.....	52
MACHINE BOLTS.....	66	Cold Rolled.....	53
MACHINERY STEEL.....	50	SHEETS, Blue Annealed.....	24
MANHEAD SUPPORT.....	99	Galvanized.....	26
MAN-HOLES AND HAND-HOLES.....	16	High Grade.....	27
MAN-HOLE BOLTS.....	70	One Pass Cold Rolled.....	25
MAULS.....	120	Steel.....	24-25
MEASURING WHEEL.....	112	SHEET IRON.....	25
MOULDINGS, Ornamental Wrought		SLEIGH-SHOE STEEL.....	50
Iron.....	64	SMOKE BOX EXTENSION.....	106
NAILS, Wire.....	83	SMOOTH FINISH OPEN HEARTH	
NOZZLES, Boiler.....	98	MACHINERY STEEL BARS.....	50
NUTS, Cold Punched.....	80	SOLDER.....	88
Finished.....	81	SPECIFICATIONS, Hartford Standard.....	9
Hot Pressed.....	78-79	SPIKES, Boat.....	84
ORNAMENTAL WROUGHT IRON		Track.....	85
MOULDINGS.....	64	SPRING COTTERS.....	77
PACKING HOUSE BEEF RAIL.....	49	Keys.....	77
PICKLED STEEL.....	27	Steel.....	51
PIPE CUTTERS.....	109	STAIR TREAD.....	22-23
PLATES, Flange Steel.....	10-11	STAMPING STEEL.....	27
Fire Box Steel.....	8	STAYBOLTS.....	90
Floor.....	20-21	STAYBOLT CHUCK.....	114
Tank Steel.....	18-19	Header.....	114
Universal.....	17	Iron.....	61
PLOW BOLTS.....	69	STEEL HEADS.....	12-13-14-15
PLUGS, Flue.....	89	Fire Box.....	8
Fusible.....	89	Flange.....	10-11
POST COLLARS.....	40	Floor Plate.....	20-21-22-23
Caps.....	40	Tank.....	18-19
PRESSED BRICK SIDING.....	28	Universal Rolled.....	17
PUMPS, Boiler Test.....	112	STEEL SHEETS, Blue Annealed.....	24
PUNCHES, Standard.....	123	Galvanized.....	26
Boilermakers' Screw.....	122	High Grade Sheet.....	27
Hollow Hand.....	119	One Pass Cold Rolled.....	25
RAIL FORKS.....	148	STEEL TIRE.....	48
Tongs.....	148	STIRRUPS, Single and Double.....	41
RATCHETS.....	127	STONE SAW BLADES.....	49
RATCHET DRILLS.....	127	STOVE BOLTS.....	68
REAMERS, Air Drill.....	137	STRAND, Wire.....	76
Center.....	137	STRUCTURAL MATERIAL.....	36
Pipe.....	135	STUD BOLTS.....	71
RIVET SETS.....	114	TANK LUGS.....	75
		TAMPING BARS.....	148
		TAPS, Boiler.....	136
		Machinists' Hand.....	134
		Mud or Washout.....	136
		Patch Bolt.....	90
		Pipe.....	135

MACHINERY INDEX ON PAGE 7.
INDEX OF TABLES, ETC., ON PAGE 6.

INDEX—Continued.

TAPS,—Continued	PAGE	EXTRAS—Continued.	PAGE
Staybolt.....	91	Norway and Swedish Iron.....	244
Wrenches.....	135	Plates, for Rolling.....	247
TEES.....	39	Spring Steel.....	241
TEST PUMP, Boiler.....	112	Tire.....	239
TIRE STEEL.....	48	Tool Steel.....	242
TONGS, Rail.....	148	FLUE SPACING AND HEAD BRACING	
TOOLS, Hand.....	116-117	.....	298-299-300-301
Pneumatic.....	114-115	HARTFORD RIVET LAPS	
TOOL STEEL.....	54-55-56-57	.....	292-293-294-295-296-297
TORCHES, Phoenix Gasoline.....	113	NUTS, Number in Kegs.....	284
TRACK BOLTS.....	85	RIVETED JOINTS 292-293-294-295-296-297	
Drill.....	149	RIVETS, Shearing and Bearing Value	
Gauge.....	148	of.....	279
Spikes.....	85	Number in 100 Pounds.....	281
Tools.....	148	SAFE LOADS—	
TREAD, Universal Safety.....	22-23	Angles.....	276-277-278
TROLLEYS.....	155	"1" Beams.....	268-269
TUBES, Iron, Seamless, Steel.....	30-31	Channels.....	270-271
Cleaners.....	111	Floor Plates.....	21
TURNBUCKLES.....	74	Tees.....	272-273
UNIVERSAL PLATES.....	17	"Z" Bars.....	275
VALVES, Blow-off.....	100-101	SCREW ENDS, UPSET.....	287
Hydraulic.....	102-103	SCREW THREADS, Standard.....	286
VISES.....	143-144-145-146-147	SHEARING AND BEARING—	
VISE BOXES AND SCREWS.....	143	Value of Rivets.....	279
WASHERS.....	82-83	SIZES OF PLATES AND HEADS WE	
WEATHERBOARDING, Steel.....	29	CAN FURNISH.....	251
WHEELS, Norton Grinding.....	141	SPECIFICATIONS, STANDARD.....	248-249
WIRE STRAND, Galvanized.....	76	SPIKES, STEEL BOAT, Number in 100	
Clips.....	76	Pounds.....	285
Hooks, Rings, etc.....	76	STEAM BOILER MEASUREMENTS.....	304
Nails.....	83	VARIATION IN SHEARING.....	247
WRENCHES.....	124-125-126	WASHERS, Number in Keg.....	285
Tap, Adjustable.....	135	WEIGHTS—	
Track.....	148	Angles.....	265
"Z" BARS.....	39	Band Steel.....	260
TABLES, ETC.		Bar Steel.....	256-257-258
ALLOWANCES FOR DOME PLATES.....	16	Beams, Steel.....	266
ALLOWANCES FOR OVERWEIGHT.....	250	Black Sheets—Estimated.....	254
CAPACITY IN TANKS.....	290-291	Boat Spikes.....	285
CIRCUMFERENCES AND AREAS OF		Boiler Heads.....	253
CIRCLES.....	289	Carriage Bolts, per Hundred.....	283
CLASSIFICATIONS—		Channels, Light or Grooved.....	263
National Iron.....	243	Channels, Steel.....	267
Norway and Swedish Iron.....	244	Flat, Round and Square Iron.....	262
Spring Steel.....	241	Flat Steel Bars.....	257
Standard Steel.....	236-237-238	Galvanized Sheets—Estimated.....	255
Steel Hoop.....	240	Hoop Steel.....	261
Stone Saw Blades.....	239	Iron and Steel.....	254
Tire Steel.....	239	Lag Screws, per Hundred.....	283
Tool Steel.....	242	Machine Bolts, per Hundred.....	282
DECIMALS OF A FOOT.....	288	Nuts and Bolt Heads in Pounds.....	285
DIFFERENTIALS, QUANTITY, Bars,		Oval and Half Oval Steel.....	284
Bands, Tires, Saw Blades,		Rails, Tee.....	259
Small Shapes, on Mill		Rivets, per Hundred.....	280
Orders.....	339	Sheets and Plates.....	252
EXTRAS—		Sheets, Black.....	254
Beams and Channels.....	36	Sheets, Galvanized.....	255
Black Sheets.....	245	Steel Boiler Heads.....	253
Galvanized Sheets.....	245	Steel—Round and Square.....	256
Hoop Steel.....	240	Steel Tires.....	258
Iron Bars, Bands, Ovals, etc.....	243	Structural Shapes.....	264-265-266-267
Nail Advances.....	246	Tees.....	264
		Wagon Box Iron.....	258
		Washers.....	285
		Zeas.....	274

MACHINERY INDEX.

	PAGE		PAGE
AIR COMPRESSORS.....	202-203	HOSE, Metallic.....	213
AIR HOISTS.....	214-215	HYDRAULIC RIVETERS.....	201
ALLIGATOR SHEARS.....	163	Flange Press.....	201
ANGLE BENDERS, Hand.....	234-235	Wheel Press.....	200
Power.....	178-180		
ANGLE SHEARS, Hand.....	224	PLANER, Rotary.....	218
Power.....	165-198	PNEUMATIC CLUTCH TRIP.....	174-175
BAR SHEARS, Hand.....	222	PNEUMATIC TOOLS.....	210-211
Power.....	163-165	PNEUMATIC RIVETERS.....	204-205-206
BENCH SHEARS.....	220	PNEUMATIC PUNCH.....	216
BENDERS, Hand Power.....	234-235	PNEUMATIC STAYBOLT NIPPER.....	218
BEVEL SHEARS, Wangler.....	158-159	PORTABLE HAND PUNCHES.....	229
BOLT CUTTERS.....	196	PORTABLE HAND SHEARS.....	220
BOLT HEADERS.....	197	POST HAMMERS.....	185
BRAKES.....	233	POWER PRESS.....	233
BULLDOZERS.....	199	PUNCHES Hand.....	227-228-229
		Double End.....	167
CLAMPS, Flanging.....	231	Horizontal.....	170
CLUTCH TRIP, Pneumatic.....	174-175	Pneumatic.....	216
COMBINED PUNCHES AND SHEARS—		Power.....	166-167-168-169-170-171
Hand.....	221-224-226-227	Quick Acting.....	167
Power.....	230	Special.....	170
COMPRESSORS, Air.....	202-203	RIVET HEATERS.....	214
COPING MACHINES.....	171	RIVETERS, Pneumatic.....	216
CORRUGATED ROLLS.....	179	Belt Driven Stake.....	172-173
COUPLINGS, Scully Hose and Pipe.....	208	Hydraulic.....	201
CUTTERS, Tube and Pipe.....	219	Pneumatic Squeeze.....	204-205-206
		ROD CUTTERS, Hand.....	222
DRILLS, Electric.....	193	ROLLS, Angle Bending.....	178-180
Upright.....	190-192	Corrugated.....	179
Pneumatic.....	210	Plate Bending.....	176-177-178
Post.....	194-195	Sheet Iron.....	178
Radial.....	191	ROTARY SPLITTING SHEARS.....	160-161
Suspension.....	192	ROTARY THROAT SHEARS.....	162
EMERY GRINDERS.....	181	ROTARY PLANER.....	218
FLANGING CLAMPS.....	231	SAND BLAST.....	217
FLANGING MACHINE, Hydraulic.....	201	SAWS, Power Circular.....	188-189
FLUE WELDERS.....	212	Power Hack.....	186-187
FORGES, Flue Welding.....	213	SHEARS, Wangler Bevel.....	158-159
Rivet Heating.....	209	Alligator or Scrap.....	163
FORGING MACHINES.....	197	Angle.....	165-200-229
		Guillotine Bar.....	165
GRINDERS.....	181	Hand.....	220-221-222-223-224
HACK SAWS.....	186-187	Portable Bench.....	220
HAMMERS, Steam.....	182	Rotary Splitting.....	160-161
Helve.....	184	Rotary Throat.....	162
Pneumatic.....	210	Squaring.....	225-232
Post.....	185	Stroke Type Splitting.....	164
Upright.....	183-185	Turret.....	165
HAND PUNCHES.....	227-228-229	STAYBOLT NIPPERS.....	218
Benders.....	234	STAKE RIVETERS.....	172-173
Rolls.....	181	STEAM HAMMERS.....	182
Shears.....	220-221-222-223-224	SQUARING SHEARS, Foot.....	225
HEATERS, Portable Oil.....	207	Power.....	232
Rivet.....	209	TUBE CUTTERS.....	219
HOISTS, Pneumatic.....	214-215	WELDER Flue.....	212
HOSE COUPLINGS.....	208	WHEEL PRESS.....	200

HARTFORD FIREBOX STEEL.

SIZES IN STOCK.

NOTE.—These plates are all made according to the requirements of the Hartford Steam Boiler Inspection & Insurance Co., as per specifications on opposite page, and each plate has been tested and the mill's affidavit of the mill test has been accepted by the Hartford Co. The sizes shown below are all for boilers with Triple Riveted Butt Joints. The three sizes in each space are the only plates except heads required to make the boilers they are listed under.

BOILER 60 IN. DIA. X 16 FT. LONG.

190 $x95\frac{1}{2}x\frac{5}{16}$ Shell Plates
 $95\frac{1}{2}x14\frac{3}{4}x\frac{1}{4}$ Inside Butt Straps
 $95\frac{1}{2}x9\frac{3}{4}x\frac{1}{4}$ Outside " "

190 $x95\frac{1}{2}x\frac{3}{8}$ Shell Plates
 $95\frac{1}{2}x14\frac{3}{4}x\frac{5}{16}$ Inside Butt Straps
 $95\frac{1}{2}x9\frac{3}{4}x\frac{5}{16}$ Outside " "

BOILER 60 IN. DIA. X 18 FT. LONG.

190 $x73x\frac{3}{8}$ Shell Plates
 $73x14\frac{3}{4}x\frac{5}{16}$ Inside Butt Straps
 $73x9\frac{3}{4}x\frac{5}{16}$ Outside " "

BOILER 66 IN. DIA. X 16 FT. LONG.

209 $x96\frac{1}{2}x\frac{5}{16}$ Shell Plates
 $96\frac{1}{2}x16x\frac{3}{8}$ Inside Butt Straps
 $96\frac{1}{2}x10\frac{1}{2}x\frac{3}{8}$ Outside " "

209 $x95\frac{1}{2}x\frac{3}{8}$ Shell Plates
 $95\frac{1}{2}x14\frac{3}{4}x\frac{5}{16}$ Inside Butt Straps
 $95\frac{1}{2}x9\frac{3}{4}x\frac{5}{16}$ Outside " "

BOILER 66 IN. DIA. X 18 FT. LONG.

209 $x73x\frac{3}{8}$ Shell Plates
 $73x14\frac{3}{4}x\frac{5}{16}$ Inside Butt Straps
 $73x9\frac{3}{4}x\frac{5}{16}$ Outside " "

209 $x73x\frac{5}{16}$ Shell Plates
 $73x16x\frac{3}{8}$ Inside Butt Straps
 $73x10\frac{1}{2}x\frac{3}{8}$ Outside " "

BOILER 72 IN. DIA. X 16 FT. LONG.

228 $x64\frac{3}{4}x\frac{3}{8}$ Shell Plates
 $64\frac{3}{4}x14\frac{3}{4}x\frac{5}{16}$ Inside Butt Straps
 $64\frac{3}{4}x9\frac{3}{4}x\frac{5}{16}$ Outside " "

228 $x64\frac{3}{4}x\frac{7}{16}$ Shell Plates
 $64\frac{3}{4}x16x\frac{3}{8}$ Inside Butt Straps
 $64\frac{3}{4}x10\frac{1}{2}x\frac{3}{8}$ Outside " "

228 $x95\frac{1}{2}x\frac{3}{8}$ Shell Plates
 $95\frac{1}{2}x14\frac{3}{4}x\frac{5}{16}$ Inside Butt Straps
 $95\frac{1}{2}x9\frac{3}{4}x\frac{5}{16}$ Outside " "

228 $x96\frac{1}{2}x\frac{7}{16}$ Shell Plates
 $96\frac{1}{2}x16x\frac{3}{8}$ Inside Butt Straps
 $96\frac{1}{2}x10\frac{1}{2}x\frac{3}{8}$ Outside " "

BOILER 72 IN. DIA. X 18 FT. LONG.

228 $x73x\frac{3}{8}$ Shell Plates
 $73x14\frac{3}{4}x\frac{5}{16}$ Inside Butt Straps
 $73x9\frac{3}{4}x\frac{5}{16}$ Outside " "

228 $x73x\frac{7}{16}$ Shell Plates
 $73x16x\frac{3}{8}$ Inside Butt Straps
 $73x10\frac{1}{2}x\frac{3}{8}$ Outside " "

228 $x107\frac{1}{2}x\frac{3}{8}$ Shell Plates
 $107\frac{1}{2}x14\frac{3}{4}x\frac{5}{16}$ Inside Butt Straps
 $107\frac{1}{2}x9\frac{3}{4}x\frac{5}{16}$ Outside " "

228 $x107\frac{1}{2}x\frac{7}{16}$ Shell Plates
 $107\frac{1}{2}x16x\frac{3}{8}$ Inside Butt Straps
 $107\frac{1}{2}x10\frac{1}{2}x\frac{3}{8}$ Outside " "

For Boiler Heads to make above boilers, see pages 12 and 13.

For detailed drawings of Rivet Laps and Heads, see pages 292 to 301 inc.

For Table giving details of above joints, see opposite page.

Plates cut to any size desired; extra charge for labor and waste.

WRITE FOR PRICES.

HARTFORD SPECIFICATIONS.

The following are the specifications, for steel plate, of the Hartford Steam Boiler Inspection and Insurance Co.

OPEN HEARTH FIRE BOX STEEL

To have a tensile strength of not less than 55,000 lbs., nor more than 62,000 lbs. per square inch of section, with not less than 56% of ductility as indicated by contraction of area at point of fracture under test, and by an elongation of 25% in a length of 8 inches.

HEADS—To be made of best Open Hearth Flange Steel, 60,000 T. S. All plates, both of shell and heads, must be plainly stamped with name of maker, brand and tensile strength; brands so located that they may be seen on each plate after boiler is finished. Each shell plate must bear a coupon which shall be sheared off, finished up and tested by the maker of the boiler, at his own expense. Each coupon must fill the above requirements as to strength and ductility, and must also stand bending down double when cold, when red hot and after being heated red hot and quenched in cold water, without signs of fracture. All plates failing to pass these tests will be rejected. All tests and inspections of material shall be made at the place of manufacture prior to shipment.

TABLES

Showing details of rivet laps for different thicknesses of boiler plate as advocated by the Hartford Steam Boiler Inspection and Insurance Co. for

DOUBLE RIVETED BUTT JOINTS.

Thickness of Plate.	Diameter of Rivets.	Pitch of Rivets in Inches.	Width of Outside Butt Strap.	Width of Inside Butt Strap.	Thickness of Covering Straps.	Vertical or Transverse Pitch.	Edge of Butt Strap to center of Rivets.	Pitch of Rivets Girth Seam.	Edge of Plate to center of Rivets Girth Seam.	Strength of Joint.
$\frac{1}{8}$ in	$\frac{1}{8}$ in	$2\frac{1}{4} \times 4\frac{1}{2}$	$4\frac{1}{2}$ in	9	$\frac{1}{8}$ in	$2\frac{1}{4}$ in	$1\frac{1}{8}$ in	$2\frac{1}{8}$ in	$1\frac{1}{8}$ in	83%
$\frac{3}{16}$ in	$\frac{3}{16}$ in	$2\frac{3}{8} \times 4\frac{3}{8}$	$4\frac{3}{8}$	$9\frac{1}{8}$	$\frac{3}{16}$ in	$2\frac{3}{8}$ in	$1\frac{3}{8}$ in	$2\frac{3}{8}$ in	$1\frac{3}{8}$ in	82.9%
$\frac{1}{2}$ in	$\frac{1}{2}$ in	$2\frac{1}{2} \times 5\frac{1}{2}$	$5\frac{1}{2}$	$10\frac{1}{2}$	$\frac{1}{2}$ in	$2\frac{1}{2}$ in	$1\frac{1}{2}$ in	$2\frac{1}{2}$ in	$1\frac{1}{2}$ in	82%
			$5\frac{3}{8}$	$11\frac{1}{4}$						80%

TRIPLE RIVETED BUTT JOINTS.

Thickness of Plate.	Diameter of Rivets.	Pitch of Rivets in Inches.	Width of Outside Butt Strap.	Width of Inside Butt Strap.	Thickness of Covering Straps.	Vertical or Transverse Pitch.	Edge of Butt Strap to center of Rivets.	Pitch of Rivets Girth Seam.	Edge of Plate to center of Rivets Girth Seam.	Strength of Joint.
$\frac{1}{8}$ in	$\frac{1}{8}$ in	$2\frac{1}{4} \times 4\frac{1}{2}$	$6\frac{1}{2}$ in	$11\frac{1}{2}$ in	$\frac{1}{8}$ in	$1\frac{1}{2}$ in	$1\frac{1}{8}$ in	$2\frac{1}{8}$ in	$1\frac{1}{8}$ in	87.5%
$\frac{3}{16}$ in	$\frac{3}{16}$ in	$2\frac{3}{8} \times 4\frac{3}{8}$	$6\frac{3}{8}$	$12\frac{3}{8}$	$\frac{3}{16}$ in	$1\frac{3}{8}$ in	$1\frac{3}{8}$ in	$2\frac{3}{8}$ in	$1\frac{3}{8}$ in	86%
$\frac{1}{2}$ in	$\frac{1}{2}$ in	$2\frac{1}{2} \times 5\frac{1}{2}$	$9\frac{1}{4}$	14	$\frac{1}{2}$ in	$2\frac{1}{2}$ in	$1\frac{1}{2}$ in	$2\frac{1}{2}$ in	$1\frac{1}{2}$ in	88%
			$9\frac{1}{8}$	14						88%
			$9\frac{1}{4}$	$14\frac{1}{4}$						87.5%
			$9\frac{1}{8}$	$14\frac{1}{8}$						87.5%
			$10\frac{1}{8}$	$15\frac{1}{8}$						86%
			$10\frac{3}{8}$	16						86%
			11	$16\frac{1}{4}$						86.6%

For detailed drawings of above laps, see pages 292 to 301 inclusive.

FLANGE STEEL—60,000 T. S. **SIZES IN STOCK.**

For Stock on Hand see our Monthly Stock List.

Size
1-4 x24 x 120
x26 x 120
x26 x 138
x30 x 120
x30 x 138
x32 x 120
x32 x 138
x36x 98
x36 x 120
x36 x 138
x38 x 120
x38 x 138
x40 x 120
x40 x 138
x42 x 120
x42 x 138
x44 x 98
x44 x 120
x44 x 138
x48 x 120
x48 x 138
x48 x 156
x49 x 98
x49 x 118
x49 x 138
x49 x 143
x49 x 156
x54 x 98
x54 x 120
x54 x 138
x54 x 156
x57 x 98
x57 x 118
x57 x 138
x57 x 143
x57 x 156
x60 x 98
x60 x 120
x60 x 138
x60 x 143
x60 x 156
x64 $\frac{1}{2}$ x 98
x64 $\frac{1}{2}$ x 118
x64 $\frac{1}{2}$ x 138
x64 $\frac{1}{2}$ x 143
x64 $\frac{1}{2}$ x 156
x72 x 98

For Stock on Hand see our Monthly Stock List.

Size
1-4 x72 x 120
x72 x 138
x72 x 143
x72 x 156
x84 $\frac{1}{2}$ x 98
x84 $\frac{1}{2}$ x 118
x84 $\frac{1}{2}$ x 138
x84 $\frac{1}{2}$ x 143
x84 $\frac{1}{2}$ x 156
x96 x 98
x96 x 118
x96 x 138
x96 x 143
x96 x 156
5-16 x11 x 73
x11 x 95 $\frac{1}{2}$
x11 x 107 $\frac{1}{2}$
x14 $\frac{1}{2}$ x 95 $\frac{1}{2}$
x16 x 73
x16 x 95 $\frac{1}{2}$
x16 x 107 $\frac{1}{2}$
x26 x 80
x26 x 99
x26 x 120
x26 x 138
x30 x 80
x30 x 99
x30 x 120
x30 x 138
x32 x 80
x32 x 99
x32 x 120
x32 x 138
x36 x 80
x36 x 90
x36 x 99
x36 x 120
x36 x 138
x38 x 80
x38 x 90
x38 x 99
x38 x 120
x38 x 138
x40 x 80
x40 x 90
x40 x 99
x40 x 120

For Stock on Hand see our Monthly Stock List.

Size
5-16 x40 x 138
x42 x 120
x42 x 138
x44 x 99
x44 x 120
x44 x 138
x48 x 120
x49 x 80
x49 x 90
x49 x 99
x49 x 118
x49 x 138
x49 x 143
x49 x 156
x49 x 175
x49 x 194
x50 x 120
x50 x 138
x54 x 99
x54 x 120
x54 x 138
x57 x 80
x57 x 90
x57 x 99
x57 x 118
x57 x 138
x57 x 143
x57x 156
x57 x 175
x57 x 194
x60 x 120
x60 x 138
x64 $\frac{1}{2}$ x 90
x64 $\frac{1}{2}$ x 99
x64 $\frac{1}{2}$ x 118
x64 $\frac{1}{2}$ x 138
x64 $\frac{1}{2}$ x 143
x64 $\frac{1}{2}$ x 156
x64 $\frac{1}{2}$ x 175
x64 $\frac{1}{2}$ x 194
x72 $\frac{1}{2}$ x 99
x72 $\frac{1}{2}$ x 120
x72 $\frac{1}{2}$ x 138
x72 $\frac{1}{2}$ x 143
x72 $\frac{1}{2}$ x 156
x72 $\frac{1}{2}$ x 175
x72 $\frac{1}{2}$ x 194

See page 12 for Flange Steel Heads.

See page 304 for sizes of boilers above plates will make.

See page 247 for Extras on Extra Widths.

See page 254 for Estimating Weights.

Plates cut to any size desired; extra charge for labor and waste.

WRITE FOR PRICES.

FLANGE STEEL—60,000 T. S. SIZES IN STOCK.

For Stock on Hand see our Monthly Stock List.

Size	
5-16 x 84½ x 118	
x 84½ x 138	
x 84½ x 143	
x 84½ x 156	
x 84½ x 175	
x 84½ x 194	
x 95½ x 99	
x 95½ x 118	
x 95½ x 138	
x 95½ x 143	
x 95½ x 156	
x 95½ x 175	
x 95½ x 194	
x 107½ x 194	
3-8 x 11 x 73	
x 11 x 95½	
x 11 x 107½	
x 16 x 73	
x 16 x 95½	
x 16 x 107½	
x 24 x 120	
x 30 x 120	
x 36 x 99½	
x 36 x 120	
x 36 x 138	
x 36 x 156	
x 39 x 99½	
x 40 x 120	
x 40 x 138	
x 42 x 120	
x 42 x 138	
x 44 x 99	
x 44 x 120	
x 44 x 138	
x 48 x 120	
x 48 x 138	
x 49 x 99	
x 49 x 118	
x 50 x 120	
x 50 x 138	
x 54 x 120	
x 54 x 138	
x 57 x 118	
x 57 x 138	
x 60 x 120	

For Stock on Hand see our Monthly Stock List.

Size	
3-8 x 60 x 138	
x 64½ x 108	
x 64½ x 118	
x 64½ x 138	
x 64½ x 156	
x 64½ x 194	
x 64½ x 212½	
x 64½ x 232½	
x 72½ x 99	
x 72½ x 108	
x 72½ x 118	
x 72½ x 138	
x 72½ x 156	
x 72½ x 194	
x 72½ x 212½	
x 72½ x 232½	
x 73 x 190	
x 84 x 120	
x 95½ x 156	
x 95½ x 190	
x 95½ x 194	
x 95½ x 212½	
x 95½ x 232½	
x 96 x 118	
x 107½ x 190	
x 107½ x 194	
x 107½ x 212½	
x 107½ x 232½	
7-16 x 11 x 73	
x 11 x 95½	
x 11 x 107½	
x 18 x 73	
x 16 x 95½	
x 16 x 107½	
x 24 x 120	
x 36 x 120	
x 48 x 120	
x 60 x 120	
x 72 x 120	
x 73 x 209	
x 95½ x 209	
x 107½ x 209	
1-2 x 24 x 120	
x 30 x 120	

For Stock on Hand see our Monthly Stock List.

Size	
1-2 x 36 x 120	
x 48 x 120	
x 60 x 120	
x 72 x 120	
x 73 x 228	
x 95½ x 228	
x 107½ x 228	
5-8 x 36 x 120	
x 48 x 120	
x 60 x 120	
x 72 x 120	
3-4 x 36 x 120	
x 44 x 120	
x 48 x 120	
x 60 x 120	

NOTE

**IRON PLATES
AND
SHEETS
FURNISHED
FROM MILLS**

See page 12 for Flange Steel Heads.

See page 304 for sizes of boilers above plates will make.


See page 247 for Extras on Extra Widths.

See page 254 for estimating weights.

Plates cut to any size desired; extra charge for labor and waste.

WRITE FOR PRICES.

FLANGE AND TANK STEEL HEADS— 60,000 T. S. IN STOCK.

 Sizes carried in Stock are shown by check mark ✓.

Diam. of Heads, Inches.	Thickness and Quality of Heads.												
	No. 10	3-16	1-4	5-16		3-8		7-16		1-2		5-8	
	Tank	Tank	Tank	Flange	Tank	Flange	Tank	Flange	Tank	Flange	Tank	Flange	Tank
14	.	.	.	✓	.	✓	✓
16	.	.	.	✓	.	✓	✓
18	.	.	.	✓	.	✓	✓
20	.	✓	✓	✓	✓	✓	✓
22	.	✓	✓	✓	✓	✓	✓
24	.	✓	✓	✓	✓	✓	✓
26	.	✓	✓	✓	✓	✓	✓
28	.	✓	✓	✓	✓	✓	✓
30	.	✓	✓	✓	✓	✓	✓	✓	.	✓	.	.	.
32	.	✓	✓	✓	✓	✓	✓	✓	.	✓	.	.	.
34	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	.
36	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	.
38	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	.
40	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	.
42	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	.
44	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	.
46	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.	.
48	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.
49	.	.	✓	✓	.	✓	✓	.	.	✓	.	.	.
52 ¹ / ₂	.	✓	✓	.	✓	✓	✓	✓	✓	✓	✓	.	.
53	.	.	.	✓
54	.	.	.	✓	✓	.	.	.
58 ¹ / ₂	.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	.	.
59	.	.	✓	✓	.	.	.	✓
60	.	.	✓	✓	.	.	.	✓	.	✓	.	.	.
65	.	✓	✓	✓	✓	✓	✓	✓
66	.	.	.	✓	.	.	.	✓	✓	✓	.	.	.
71	.	.	✓	.	✓	✓	✓	✓	.	✓	.	✓	.
72	✓	.	.	.	✓	.	✓	.
75	.	✓
77	.	.	✓	.	✓	✓
78	.	.	✓	✓	.	.	✓	✓	.	✓	.	✓	✓
81	.	.	.	✓	✓	.	.	.
87
89	.	.	✓	.	✓	✓	✓
101	.	.	✓	✓	✓	✓	✓	.	.	✓	.	.	.

See opposite page for heads already flanged.
See pages 10 and 11 for Flange Steel Plates.
See pages 18 and 19 for Tank Steel Plates.
For weights of Steel Boiler Heads see page 253.

WRITE FOR PRICES.

MACHINE FLANGED HEADS. FLANGE AND TANK STEEL—55,000 TO 60,000 T. S.

IN STOCK.

✂ Sizes carried in Stock are shown by check mark✓

Thickness and Quality of Heads.

Outside Dia. of Heads after being flanged.	3-16	1-4	5-16		3-8		7-16		1-2	
	Tank	Tank	Flange	Tank	Flange	Tank	Flange	Tank	Flange	Tank
14 in.										
16										
17										
18										
20										
22										
24	✓	✓								
26										
28										
30	✓	✓								
32	✓	✓								
34										
35½										
36	✓	✓								
38										
40	✓									
41½										
41¾										
42	✓	✓								
43½										
43¾										
44	✓	✓								
46										
47½										
47¾										
48	✓	✓								
53½										
54										
59½										
59¾										
60	✓	✓								
60½										
65										
65½										
66										
71½										
71¾										
72										

Heads up to 48 inch diameter have 2 inch flange.

Heads 48 and 54 inch diameter have 2½ inch flange.

Heads 60, 66 and 72 inch diameter have 2½ inch flange.

See pages 14 and 15 for price list of Flanging, Dishing, Drilling and Punching.

See pages 18 and 19 for Tank Steel Plates.

WRITE FOR PRICES.

PRICES FOR FLANGING HEADS.

Adopted as standard by Steel Plate Manufacturers April 4, 1901.

Send sketch of heads wanted, giving THICKNESS and QUALITY of Steel. OUTSIDE DIAMETER of finished HEADS. Number of flue holes, if any. INSIDE DIAMETER OF FLUE HOLES. Distance between centers of Flue Holes. Distance between center line of upper row of Flue Holes and center line of Head. State whether Flue Holes are to be flanged same way as outside flange, or in the opposite direction.

Outside Dia. after being Flanged.	Thickness of Heads.										
	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{5}{8}$ & $\frac{3}{4}$ in.	$\frac{7}{8}$ & $1\frac{1}{2}$ in.	$\frac{9}{8}$ & $\frac{5}{4}$ in.	$1\frac{1}{8}$ & $1\frac{3}{4}$ in.	$1\frac{3}{8}$ & $\frac{7}{4}$ in.	$1\frac{5}{8}$ & $1\frac{1}{2}$ in.	$1\frac{3}{4}$ & $1\frac{1}{4}$ in.		
12 in. and under 18 in.	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	.....	.....	.....	.....	.....	.....
18	1.00	1.00	1.00	1.00	1.00	\$1.50	.....	.....	.....	.....	.....
24	1.00	1.00	1.00	1.00	1.20	1.80	\$2.00	.....	.....	.....	.....
30	1.20	1.20	1.10	1.20	1.70	2.30	2.70	.....	.....	.....	.....
36	1.60	1.60	1.40	1.60	2.30	2.90	3.50	\$4.20	.....	\$5.30	.....
42	2.00	2.00	1.80	2.00	3.00	3.70	4.40	5.40	6.70	.....	.....
48	3.00	2.70	2.40	2.70	3.70	4.70	5.50	6.80	8.40	.....	.....
54	4.00	3.50	3.00	3.50	4.40	6.00	6.90	8.50	10.20	.....	.....
60	.....	4.30	3.70	4.30	5.50	7.30	8.40	10.20	12.00	.....	.....
66	.....	5.50	4.50	5.50	6.70	8.60	9.90	11.90	13.80	.....	.....
72	.....	6.80	5.50	6.80	8.00	9.90	11.50	13.70	15.90	.....	.....
78	.....	8.20	6.80	8.20	9.40	11.20	13.20	15.70	18.30	.....	.....
84	.....	10.00	8.30	10.00	11.00	12.50	15.00	18.00	21.00	.....	.....
90	.....	12.20	10.10	12.20	14.30	16.50	18.20	20.30	24.00	.....	.....
96	.....	15.50	12.10	15.50	17.60	20.50	22.60	25.50	29.00	.....	.....
102	.....	.....	15.00	19.00	21.00	25.00	27.00	30.00	34.00	.....	.....
108	.....	.....	18.00	23.00	26.00	30.00	33.00	36.00	41.00	.....	.....
120	.....	.....	.....	27.00	31.00	35.00	39.00	43.00	49.00	.....	.....
128	.....	.....	.....	32.00	36.00	41.00	45.00	50.00	57.00	.....	.....
134	.....	.....	.....	37.00	41.00	47.00	51.00	57.00	65.00	.....	.....
140	.....	.....	.....	42.00	46.00	53.00	57.00	64.00	75.00	.....	.....
Total Depth	2 in.	3 in.	4 in.	4½ in.	5 in.	5½ in.	6 in.	6½ in.	7 in.	.....	.....

Where the total depth, including metal, radius and straight flange exceeds the normal total depth given above, 10 per cent. to be added to list for each additional $\frac{1}{2}$ in. or fraction thereof.

FLANGING ALLOWANCES.

Allowances for ordinary flange for single row of rivets.									Extra Allow- ance for Dishing	Extra Allow- ance for Wide Flange for Double Row Riv.
Outside Diam.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$ — $\frac{3}{4}$	$\frac{7}{8}$ — $\frac{1}{2}$	$\frac{9}{8}$ — $\frac{5}{4}$	$1\frac{1}{8}$ — $\frac{3}{4}$	$1\frac{3}{8}$ — $\frac{7}{8}$	$1\frac{1}{2}$ —1	All Gauges	All Gauges
12-15	3	3½	3½	4	.....	.....	.....	.....	O	..
16-21	3	3½	3½	4	5	5	.....	.....	O	..
22-27	3½	3½	4	4	5	5	5½	5½	1½	..
28-33	4	4	4	4	5	5	5½	5½	1½	..
34-39	4	4	4½	4½	5	5	5½	5½	1½	4½
40-45	4½	4½	4½	4½	5	5	5½	5½	1½	4½
46-51	4½	4½	4½	4½	5	5	5½	5½	1½	4½
52-57	4½	4½	4½	5	5½	5½	6	6	1½	4½
58-63	4½	4½	5	5	5½	5½	6	6½	1½	4½
64-69	4½	5	5	5½	5½	6	6	6½	1½	4½
70-75	4½	5	5	5½	5½	6½	6½	7	1½	4½
76-81	4½	5	5	5½	5½	6½	6½	7	2½	4½
82-87	4½	5	5	5½	6	6½	7	7	2½	5
88-93	4½	5	5	6	6	6½	7	7	2½	5
94-99	.....	5	5½	6	6	6½	7	7	2½	5
100-105	.....	5	5½	6	6	7	7	7	2½	5
106-111	.....	5	5½	6	6	7	7	7	3	5
112-117	.....	5	5½	6	6	7	7	7	3½	5
118-123	.....	5	5½	6	6	7	7	7	3½	5
124-129	.....	5	5½	6	6	7	7	7½	3½	5

PRICES FOR DISHING HEADS.

Adopted as standard by Steel Plate Manufacturers, April 4, 1901.

Outside Diam. Flang'd	Max'm. Depth of Dish	Thickness of Heads.							
		3-16 & ¼ inch	5-16 & ⅝ inch	7-16 & ¾ inch	9-16 & ⅞ inch	11-16 & 1 inch	13-16 & 1 ⅛ inch	15-16 & 1 ¼ inch	1 ⅝ & 1 ¾ inch
12 in.	1 ½ in.	\$ 1.30	\$ 1.30	\$ 1.30	.....	.....	.....	.....	.....
15	2	1.30	1.30	1.30	.....	.....	.....	.....	.....
18	2 ½	1.30	1.30	1.30	\$ 1.30	.....	.....	.....	.....
24	3 ¼	1.50	1.30	1.50	1.50	\$ 2.00	.....	.....	.....
30	4	1.80	1.50	1.80	1.90	2.50	\$ 3.00	.....	.....
36	4 ¾	2.30	1.90	2.30	2.50	3.00	4.00	.....	.....
42	5 ½	2.80	2.30	2.80	3.10	4.00	5.00	\$ 6.00	\$ 7.00
48	6 ½	3.50	2.80	3.50	4.00	5.00	6.00	7.00	8.50
54	7 ¾	4.50	3.50	4.50	5.00	7.00	8.50	10.00	12.00
60	8	6.50	4.50	6.50	7.00	9.00	11.00	13.00	15.50
66	8	8.50	6.00	8.50	9.00	12.00	14.00	16.00	19.00
72	9 ½	10.50	7.50	10.50	11.00	15.00	17.00	19.00	22.50
78	9 ½	13.00	9.50	13.00	14.00	18.00	20.00	22.00	26.00
84	11 ¼	15.50	12.00	15.50	17.00	21.00	23.00	25.00	29.50
90	11 ½	18.00	15.00	18.00	20.00	24.00	27.00	30.00	35.00
96	12 ½	22.00	18.00	22.00	24.00	28.00	32.00	36.00	41.00
102	12 ¾	.....	22.00	27.00	29.00	33.00	37.00	42.00	48.00
108	14 ½	.....	27.00	33.00	34.00	38.00	43.00	48.00	55.00
114	17	.....	33.00	39.00	40.00	44.00	49.00	54.00	62.00
120	18	.....	.....	46.00	47.00	51.00	56.00	61.00	69.00
126	19	.....	.....	55.00	56.00	60.00	65.00	70.00	78.00
132	20	.....	.....	67.00	68.00	72.00	77.00	82.00	90.00

Intermediate sizes and depth of dish varying from above will be quoted on request, but in no case less than next size greater on list. Prices do not include flanging; simply dishing.

PRICES FOR FLANGING FLUE HOLES.

Adopted as standard by Steel Plate Manufacturers, April 4, 1901.

Inside Diameter of Flue Hole.	Thickness of Heads.					
	5-16 to ½ inch.	9-16 and inch.	⅞ 11-16 and ¾ inch.	13-16 and ⅞ inch.	15-16 and 1 inch.	
6 inch.	\$ 2.00	\$ 2.50	\$ 4.00	\$ 5.00	\$ 6.00	
7, 8 and 9 inch.	2.50	3.50	4.50	6.00	7.00	
10, 11 and 12 inch.	3.00	4.00	5.00	7.00	8.00	
13, 14, 15 and 16 inch.	3.50	4.50	6.00	8.00	9.00	
17, 18, 19 and 20	4.00	5.00	7.00	9.00	11.00	
22 to 24 inch.	4.50	6.00	8.00	10.00	13.00	
26 28	5.00	7.00	9.00	12.00	16.00	
30 32	6.00	8.00	11.00	15.00	19.00	
34 36	7.00	9.00	13.00	18.00	22.00	
38 40	8.00	11.00	15.00	21.00	26.00	
42 44	9.00	13.00	18.00	24.00	30.00	
46 48	10.00	16.00	21.00	28.00	35.00	
50 52	12.00	19.00	25.00	33.00	40.00	
54 56	15.00	22.00	29.00	38.00	45.00	
58 60	18.00	26.00	33.00	43.00	51.00	

Material punched out of centers to be retained by manufacturer.

Sizes other than those shown to be quoted on, but in no case price to be less than price of size immediately above same on list. An extra charge may have to be made in case holes are to be flanged in very heavy plates, which would entail extra expense for handling.

PRICE OF PUNCHING FLUE HOLES.

Dia. of hole in inches.	Thickness of Plate.		
	¼ to 5-16	⅞ to ½	9-16 to ¾
	Each.	Each.	Each.
2 to 2 ½ in.	4 cts.	5 cts.	6 cts.
2 ¾ 3	5	6	8
3 ½ 4	6	7	9
3 ¾ 4	7	8	9
4 ½	7 ½	8 ½	10

PRICE OF DRILLING FLUE HOLES.

Dia. of hole in inches.	Thickness of Plate.		
	¼ to 5-16	⅞ to ½	9-16 to ¾
	Each.	Each.	Each
1 ¾ to 2 in.	6 cts.	6 cts.	6 cts
2 ¼ 2 ½	7	7	7
2 ¾ 3	8	8	8
3 ¾ 3 ½	11	11	11
3 ¾ 4	13 ½	13 ½	13 ½
4 ½	15	15	15

LARGE PLATES FOR BOTTOMS OF BOILERS.

On application we are prepared to furnish prices for Rolling, Punching, Scarfing, and Beveling Bottom Plates for boilers, in one sheet, for any diameter from 44 to 72 inches, not exceeding eighteen feet in length.



MAN-HOLES.

Flanged in heads less than $\frac{3}{4}$ inch thick.

No. 1—9 in. x 14 in., complete with Castings,	\$10.00
No. 2—10 in. x 16 in., " " "	10.00
No. 3—11 in. x 15 in., " " "	10.00
No. 5—18 in. x 22 in., " " "	20.00
Castings only, No. 1, 2 or 3.....	6.00
Castings only, No. 5.....	12.00
Hole only, No. 1, 2 or 3	4.00
Hole only, No. 5.....	8.00

MAN-HOLES.

Flanged in Saddle Plates.



No. 1, 2 or 3 complete with Castings and Saddle Plate for single row rivets.	\$13.00
No. 1, 2 or 3 complete with Castings and Saddle Plate for double row rivets	14.00
No. 5 complete with Castings and Saddle Plate.....	29.00
Saddle Plate only, without Castings, No. 1, 2 or 3, for single row rivets..	7.00
Saddle Plate only, without Castings, No. 1, 2 or 3, for double row rivets..	8.00
Saddle Plate only, without Castings, No. 5.....	17.00

HAND-HOLES.

3 in. x 5 in. or 4 in. x 6 in., complete with Castings.....	\$2.00
5 in. x 7 in. or 6 in. x 8 in., " " ".....	2.50
Casting only, any size	1.50
Holes only, " "	1.00

DOMES PLATE ALLOWANCES.

Diameter of Domes.	Diameter of Shells.								
	30	36	42	48	54	60	66	72	84
20	6¼	5½	5¼						
22	7¼	6¼	5¾	5¼					
24	8½	7¼	6½	5¾	5½				
26		8¼	7¼	6½	6				
28		9½	8	7½	6¾	6			
30		10¾	9	8	7¼	6¾	6¼	5¾	5¼
32			10	8¾	8	7¼	6¾	6¼	5¾
34				9¾	8¾	8	7¼	7	6
36				10¾	9½	8½	8	7¾	6¾
38					10¾	9½	8¾	8	7
40						10¾	9½	9¾	7¾
42						11¾	10¼	10½	9
44							11	10	9
46							12¼	10¾	9¾
48							13	11¼	10

UNIVERSAL ROLLED STEEL PLATES.

IN STOCK. ALL 40 FT. LENGTHS.

Size, inches.	Est. Wt., lin. ft. lbs.	Size, inches.	Est. Wt., lin. ft. lbs.
$\frac{3}{16}$ x 7	4.46	$\frac{7}{16}$ x 10	14.88
$\frac{3}{16}$ x 8	5.10	$\frac{7}{16}$ x 12	17.85
$\frac{3}{16}$ x 9	5.74	$\frac{7}{16}$ x 14	20.82
$\frac{3}{16}$ x 10	6.38	$\frac{7}{16}$ x 16	23.31
$\frac{3}{16}$ x 12	7.65	$\frac{7}{16}$ x 18	26.29
$\frac{3}{16}$ x 14	8.92	$\frac{7}{16}$ x 20	29.75
$\frac{3}{16}$ x 15	9.56	$\frac{7}{16}$ x 24	35.72
$\frac{3}{16}$ x 16	10.20	$\frac{1}{2}$ x 7	11.9
$\frac{3}{16}$ x 18	11.48	$\frac{1}{2}$ x 8	13.6
$\frac{3}{16}$ x 20	12.76	$\frac{1}{2}$ x 9	15.3
$\frac{3}{16}$ x 24	15.32	$\frac{1}{2}$ x 10	17.0
$\frac{1}{4}$ x 7	5.95	$\frac{1}{2}$ x 12	20.4
$\frac{1}{4}$ x 8	6.8	$\frac{1}{2}$ x 14	23.8
$\frac{1}{4}$ x 9	7.65	$\frac{1}{2}$ x 16	27.2
$\frac{1}{4}$ x 10	8.5	$\frac{1}{2}$ x 18	30.6
$\frac{1}{4}$ x 12	10.2	$\frac{1}{2}$ x 20	34.0
$\frac{1}{4}$ x 14	11.9	$\frac{1}{2}$ x 24	40.8
$\frac{1}{4}$ x 16	13.6	$\frac{5}{8}$ x 7	14.87
$\frac{1}{4}$ x 18	15.3	$\frac{5}{8}$ x 8	17.0
$\frac{1}{4}$ x 20	17.0	$\frac{5}{8}$ x 9	19.13
$\frac{1}{4}$ x 24	20.4	$\frac{5}{8}$ x 10	21.25
$\frac{5}{16}$ x 7	7.44	$\frac{5}{8}$ x 12	25.5
$\frac{5}{16}$ x 8	8.5	$\frac{5}{8}$ x 14	29.74
$\frac{5}{16}$ x 9	9.56	$\frac{5}{8}$ x 16	34.0
$\frac{5}{16}$ x 10	10.62	$\frac{5}{8}$ x 18	38.25
$\frac{5}{16}$ x 12	12.75	$\frac{5}{8}$ x 20	42.5
$\frac{5}{16}$ x 14	14.88	$\frac{5}{8}$ x 24	51.0
$\frac{5}{16}$ x 16	17.0	$\frac{3}{4}$ x 7	17.85
$\frac{5}{16}$ x 18	19.12	$\frac{3}{4}$ x 8	20.4
$\frac{5}{16}$ x 20	21.24	$\frac{3}{4}$ x 9	22.96
$\frac{5}{16}$ x 24	25.52	$\frac{3}{4}$ x 10	25.5
$\frac{3}{8}$ x $6\frac{1}{2}$	7.97	$\frac{3}{4}$ x 12	30.6
$\frac{3}{8}$ x 7	8.93	$\frac{3}{4}$ x 14	35.71
$\frac{3}{8}$ x 8	10.2	$\frac{3}{4}$ x 16	40.8
$\frac{3}{8}$ x 9	11.48	$\frac{3}{4}$ x 18	45.92
$\frac{3}{8}$ x 10	12.75	$\frac{3}{4}$ x 20	51.0
$\frac{3}{8}$ x 12	15.3	$\frac{3}{4}$ x 24	61.20
$\frac{3}{8}$ x 14	12.86	1 x 7	23.8
$\frac{3}{8}$ x 16	20.4	1 x 8	27.2
$\frac{3}{8}$ x 18	22.96	1 x 9	30.6
$\frac{3}{8}$ x 20	25.5	1 x 10	34.0
$\frac{3}{8}$ x 24	30.6	1 x 12	40.8
$\frac{7}{16}$ x 7	10.41	1 x 14	47.6
$\frac{7}{16}$ x 8	11.9	1 x 16	54.4
$\frac{7}{16}$ x 9	13.4	1 x 20	68.0

For plates of greater dimensions, see page 18.
Plates cut to any desired length.

STEEL BARS FOR CONCRETE CONSTRUCTION

¶ We can furnish from our store—Rounds, Squares, Flats, also Square Twisted Bars.

WRITE FOR PRICES.

TANK STEEL. SIZES IN STOCK.

	Size		Size		Size
For Stock on Hand see our Monthly Stock List.	No. 8 x24x 96	For Stock on Hand see our Monthly Stock List.	3-16x42x138	For Stock on Hand see our Monthly Stock List.	1-4x36x144
	x24x120		x44x 98		x36x156
	x28x 96		x44x120		x36x300
	x30x 96		x44x138		x38x 98
	x30x120		x44x144		x38x120
	x36x 96		x44x156		x38x138
	x36x120		x48x 98		x38x144
	x40x 96		x48x120		x40x 98
	x40x120		x48x138		x40x120
	x42x 96		x48x144		x40x138
	x42x120		x48x156		x40x144
	x48x 96		x48x175		x40x156
	x48x120		x48x194		x42x 98
	x48x138		x49x118		x42x120
	x48x144		x50x120		x42x138
	x48x156		x50x138		x42x156
	x54x 96		x50x144		x42x300
	x54x120		x50x156		x44x 98
	x60x 96		x54x 98		x44x120
	x60x120		x54x120		x44x138
	x60x138		x54x138		x44x144
	x60x144		x54x144		x44x156
	x60x156		x54x156		x48x 98
	x72x 98		x60x 98		x48x120
	x72x120		x60x120		x48x138
	x72x138		x60x138		x48x144
	x72x144		x60x144		x48x156
	x72x156		x60x156		x48x175
	3-16x24x120		x60x175		x48x194
	x24x138		x60x194		x48x300
	x26x120		x72x 98		x50x120
	x26x138		x72x120		x50x138
	x28x120		x72x138		x54x 98
	x28x138		x72x144		x54x120
	x30x 98		x72x156		x54x138
	x30x120		x72x175		x54x144
	x30x138		x72x194		x54x156
	x34x 54		1-4x24x120		x54x175
	x36x 54		x24x138		x54x194
	x36x 98		x26x120		x54x300
	x36x120		x26x138		x60x 98
	x36x138		x28x120		x60x120
	x36x144		x30x 98		x60x138
	x36x156		x30x120		x60x144
	x40x 98		x30x138		x60x156
	x40x120		x30x300		x60x175
	x40x138		x32x120		x60x194
	x40x144		x32x138		x60x300
	x40x156		x36x 98		x66x300
	x42x 98		x36x120		x72x 98
	x42x120		x36x138		x72x120

See page 12 for Tank Steel Heads.

See page 247 for Extras on Extra Widths.

See page 254 for estimating weights.

Plates cut to any desired sizes; extra charge for labor and waste.

**TANK, FLANGE AND GENUINE CHARCOAL IRON
PLATES FURNISHED PROMPTLY
FROM THE MILLS.**

TANK STEEL. SIZES IN STOCK.

For Stock on Hand see our Monthly Stock List.

Size

1-4x72x138
x72x144
x72x156
x72x175
x72x194
x72x300
x84x 98
x84x120
x84x138
x84x144
x84x156
x84x175
x84x194
x96x 98
x96x120
x96x138
x96x144
x96x156
x96x175
x96x194
5-16x24x120
x30x120
x30x138
x30x300
x36x120
x36x138
x36x144
x36x156
x36x300
x40x120
x40x138
x42x120
x42x138
x42x300
x44x120
x44x138
x44x144
x44x156
x48x120
x48x138
x48x144
x48x156
x48x175
x48x194
x48x300
x49x118
x54x120
x54x138
x54x300
x60x 98
x60x120
x60x138
x60x144

For Stock on Hand see our Monthly Stock List.

Size

5-16x60 x156
x60 x175
x60 x194
x60 x300
x72 x120
x72 x138
x72 x144
x72 x156
x72 x175
x72 x194
x72 x300
x84 x118
x84 x138
x84 x144
x84 x156
x84 x175
x84 x194
x95x118
x95x144
x95x156
x95x175
x95x194
3-8x24 x120
x30 x120
x30 x300
x36 x120
x36 x138
x36 x300
x40 x120
x40 x138
x42 x120
x42 x138
x42 x300
x44 x120
x44 x138
x48 x 98
x48 x120
x48 x138
x48 x144
x48 x156
x48 x194
x48 x300
x49 x118
x54 x120
x54 x138
x54 x300
x60 x120
x60 x138
x60 x144
x60 x156
x60 x194
x60 x300
x64x118

For Stock on Hand see our Monthly Stock List.

Size

3-8x66 x300
x72 x120
x72x138
x72x144
x72x156
x72x194
x72x212 $\frac{1}{2}$
x72x232 $\frac{1}{2}$
x72 x300
x84 x120
x84 x138
x95x156
x95x194
x95x212 $\frac{1}{2}$
x95x232 $\frac{1}{2}$
x96 x118
1-2x24 x120
x30 x120
x30 x300
x36 x120
x36 x300
x40 x120
x42 x300
x48 x120
x48 x300
x54 x300
x57 x118
x60 x120
x60 x138
x60 x144
x60 x156
x60 x300
x65 x118
x66 x300
x72 x120
x72 x300
x72x118
x72x138
x72x232 $\frac{1}{2}$
x84x120
x96 x232 $\frac{1}{2}$
5-8x30 x239
x30 x300
x36 x300
x48 x300
x60 x300
x72 x300
3-4x30 x300
x36 x300
x48 x300
x60 x300
x72 x300

See page 12 for Tank Steel Heads.
See page 247 for Extras on Extra Widths.
See page 254 for estimating weights.

Plates cut to any desired sizes; extra charge for labor and waste.

IRON PLATES FURNISHED PROMPTLY FROM MILL.

SCULLY WROUGHT STEEL FLOOR PLATES.

Cheaper, Stronger and Better than Cast Iron.

"SCULLY" Wrought Steel Floor Plates are not an experiment. They have been in the market for years, and have never failed to give absolute satisfaction for use in Floors and Stairways in Buildings, Engine and Boiler Rooms, Breweries, Factories, Power Plants, Fire Escapes, Vaults, Conduit Covers, Locomotive Runner Boards and Foot Boards, Passenger and Freight Cars, War Vessels and Merchant Ships, Foundry Charging Floors, Blast Furnace Stairways and Galleries, Gas Producer Platforms and Gasometer Stairways, Cellar Doors, Gutter Crossings and Platforms, Trench Plates to Cover Pipes, Wires, etc., and for all inside and outside work where Strength, Safety, Lightness and Cheapness are of moment, and wherever it is desired to prevent slipping or afford resistance to wear.

SIZES IN STOCK.**DIAMOND PATTERN**

Size	Size	Size	Size	Size
3-16 x 24 x 72	3-16 x 30 x 120	1-4 x 28 x 120	1-4 x 48 x 96	5-16 x 42 x 120
x 24 x 96	x 36 x 72	x 30 x 120	x 48 x 120	x 48 x 96
x 24 x 120	x 36 x 96	x 36 x 72	5-16 x 30 x 120	x 48 x 120
x 26 x 96	x 36 x 120	x 36 x 96	x 36 x 72	3-8 x 30 x 96
x 26 x 120	x 48 x 96	x 36 x 120	x 36 x 96	x 30 x 120
x 28 x 120	x 48 x 120	x 42 x 96	x 36 x 120	x 36 x 96
x 30 x 72	1-4 x 24 x 120	x 42 x 120	x 42 x 96	x 36 x 120
x 30 x 96	x 26 x 120			

MAXIMUM SIZES WE CAN FURNISH.

DIAMOND PATTERN							RIBBED PATTERN									
Thickness of Plate in inches	Est. Wt. per Sq. Ft., Lbs.	Width of Plate in inches						Thickness of Plate in inches	Est. Wt. per Sq. Ft., Lbs.	Width of Plate in inches						
		24	36	44	50	56	60			24	36	42	48	56	60	72
1-8	8	120	120	120				1-8	9	120	120	120				
3-16	8¾	160	150	130	130	130	120	3-16	9¾	140	130	130	130	130	130	120
1-4	11½	170	160	160	160	160	120	1-4	12¼	170	160	160	160	160	160	120
5-16	14	190	190	180	180	170	120	5-16	14¾	190	190	180	180	180	160	120
3-8	16½	190	190	180	180	170	120	3-8	17¼	190	190	190	180	180	170	120
7-16	19	190	190	180	180	170	100	7-16	20	190	190	190	180	180	170	100
1-2	21½	190	180	180	170	150	96	1-2	22½	190	190	180	180	180	150	100
3-4	32	170	160	160	140	130	96	3-4	33	170	170	160	150	150	144	96

We can make all gauges from 1/8 inch to 1 inch in thickness and can furnish any sizes and shapes within above maximums.

WRITE FOR BOOKLET AND PRICES.

SCULLY WROUGHT STEEL FLOOR PLATE.

Cheaper per square foot than cast iron. Saves freight and handling. Enables use of lighter columns and girders. Saves 50% in weight—30% in cost. Gives handsomer and better floor.

QUALITY.

"SCULLY" plates are made from Open Hearth Steel. The special machinery used, which includes an Open Hearth Steel Plant and Blooming Mill, is the result of years of experience in the manufacture of these plates and insures clean, sharp diamonds, ribs and checkers. Compare "SCULLY" plates with others offered as a substitute.

SAFE LOADS.

In order to enable a comparison to be made between "SCULLY" Steel Plates and cast iron, so that it can be quickly seen what thickness of "SCULLY" Steel Plates to use in place of cast iron, the following table has been prepared by a prominent city structural engineer. This table is based upon fibre stresses, as required by strict building laws, a factor of safety of four. A glance will show the vast superiority of "SCULLY" Wrought Steel Plates over cast iron, and will substantiate all our claims for these plates as compared with any other kind of floor.

"SCULLY" FLOOR PLATE. THICKNESS IN INCHES.

Span in feet	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$
2	80	182	379	516	748	1021	1345	2100
3	33	77	140	222	318	444	582	918
4	16	40	75	119	176	242	318	506
5	9	22	44	72	107	148	197	315
6		13	28	46	70	97	131	211
7		8	18	30	47	67	91	148
8			11	20	33	47	65	108
9			7	13	22	33	47	80
10				8	16	24	35	60

CAST IRON PLATE. THICKNESS IN INCHES.

Span in feet	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$
2	15	36	79	110	160	221	294	485
3	4	12	25	41	63	88	118	202
4		3	10	17	29	42	58	103
5			2	7	13	20	30	60
6				2	5	8	15	32
7						2	6	17
8								7
9								
10								

Architects, engineers, shipbuilders, contractors and all interested, are requested to correspond with us. To insure against a cheaper article being substituted, specify "SCULLY" Wrought Steel Floor Plates in your contracts.

WRITE FOR BOOKLET AND PRICES.

UNIVERSAL SAFETY TREAD.

IN STOCK.

2-in., 4-in. and 6-in. wide flat and 2½-in. nosed, all in 12 foot lengths. Any width up to 12 inches and any length up to 15 feet furnished promptly from factory.

STEEL OR BRASS BASE PLATES.

We furnish the UNIVERSAL SAFETY TREAD, using a heavy STEEL or BRASS base plate, with or without a curved nosing. This nosing is a continuation of the base plate and can be curved to conform to any depth required.

ALUMINUM EDGE.

We have recently introduced a strip of ALUMINUM in the outer edge of our tread, which has greatly increased its durability.

REPAIR WORK.

In situations where stairs are badly worn down we use a special cement for leveling up the depressions. The safety treads are then installed and give the appearance of a new staircase.

EXTRA HEAVY SAFETY TREAD.

To increase the durability of our Safety Tread in situations where the wear is exceptionally severe, we have designed a special heavy tread, using a much thicker steel base plate than formerly. The vertical steel teeth are also made longer and so spaced as to reduce the openings through which the lead might have a tendency to flow. This tread will withstand the most severe tests as required on subway stairs, sidewalks and similar situations.

UNIVERSAL SAFETY TREAD.

For Buildings, Railways, Subways, Steamships, Etc.



One-half Showing Steel Base.
The Other After the Lead has been Applied.

The UNIVERSAL SAFETY TREAD is constructed of a heavy steel base plate in which openings are punched, forming rows of vertical steel teeth. The lead strands are then rolled in and clamped in position by these teeth and clinched firmly on the under side of the plate. By this construction a constantly increasing wearing surface of **LEAD** is presented until the tread is entirely worn out, while the hard steel teeth reinforce it sufficiently to insure many years of service. It is essentially a **LEAD** Safety Tread, the quantity of both metals being proportioned to combine safety and durability. The steel teeth forming a broken surface, there are no continuous "ribs" on which slipping can occur in a parallel direction. Our treads differ from all others in being non-slipping **in any direction**.

Weight about eight pounds per square foot.



Reverse of Safety Tread, Showing Lead Filling.

WRITE FOR PRICES.

BLUE ANNEALED SOFT STEEL SHEETS.**SIZES IN STOCK AND ESTIMATED WEIGHTS.**

Gauge	Size	Est.Wt. Per Sheet	Gauge	Size	Est.Wt. Per Sheet	Gauge	Size	Est.Wt. Per Sheet
No. 10	x24x 96	90.	No. 12	x30x120	109.38	No. 14	x40x 77	66.78
	x24x120	112.5		x36x 77	83.93		x40x 96	83.25
	x26x 96	97.5		x36x 84	91.88		x40x120	104.05
	x26x120	121.88		x36x 96	105.		x42x 96	87.50
	x28x 96	105.		x36x108	118.13		x42x120	109.38
	x28x120	131.35		x36x120	131.25		x48x 77	80.21
	x30x 96	112.5		x36x144	157.50		x48x 84	87.50
	x30x108	126.56		x40x 96	116.55		x48x 96	100.
	x30x120	140.63		x40x120	145.68		x48x108	112.50
	x36x 72	101.75		x42x 96	122.50		x48x120	125.
	x36x 96	135.		x42x120	153.13		x48x127	132.25
	x36x108	151.88		x48x 77	112.29		x48x138	143.75
	x36x120	168.75		x48x 84	122.50		x48x144	150.
	x36x144	202.50		x48x 96	140.00		x48x156	162.5
	x40x 96	149.85		x48x108	157.50	No. 16	x54x 77	87.40
	x40x120	187.30		x48x120	175.		x54x 96	112.50
	x42x 96	157.50		x48x127	185.15		x54x120	140.63
	x42x120	196.88		x48x138	201.25		x54x138	161.71
	x48x 77	144.38		x48x144	210.00		x54x144	168.74
	x48x 96	180.		x48x156	227.50		x54x156	171.08
	x48x108	202.50		x54x 77	126.39		x24x 96	40.
	x48x120	225.		x54x 96	157.50		x24x108	45.
	x48x138	258.75		x54x108	177.12		x24x120	50.
	x48x144	270.		x54x120	196.88		x26x 96	43.33
	x48x156	292.50		x54x138	218.21		x26x108	48.75
	x54x 77	162.50		x54x144	236.25		x26x120	54.17
	x54x 96	201.50		x54x156	255.93		x28x 96	46.67
	x54x120	253.13		x60x 77	140.14		x28x108	52.5
	x54x138	291.		x60x 96	175.		x28x120	58.33
	x54x144	303.75		x60x120	219.36		x30x 96	50.
	x54x156	329.06		x60x138	251.56		x30x108	56.25
	x60x 77	180.		x60x144	262.50		x30x120	62.5
	x60x 96	225.		x60x156	284.37		x36x 77	48.13
	x60x120	281.26	No. 14	x24x 96	50.		x36x 96	60.
	x60x138	328.44		x24x108	56.25		x36x108	67.5
	x60x144	337.50		x24x120	62.50		x36x120	75.
	x60x156	365.62		x26x 96	54.17		x36x144	90.
	x72x 96	270.		x26x108	60.94		x40x 96	66.60
	x72x120	281.25		x26x120	67.71		x40x120	83.25
	x72x138	323.42		x28x 96	58.33		x42x 96	70.
	x72x144	332.79		x28x108	65.63		x42x120	87.50
	x72x156	360.91		x28x120	72.92		x42x144	105.
No. 12	x24x 96	70.		x30x 96	62.50		x48x 77	64.17
	x24x120	87.5		x30x108	70.31		x48x 96	80.
	x26x 96	75.83		x30x120	78.13		x48x108	90.
	x26x120	94.79		x36x 77	60.18		x48x120	100.
	x28x 96	81.67		x36x 96	77.		x48x138	115.
	x28x120	102.08		x36x108	84.38		x48x144	120.
	x30x 96	87.50		x36x120	93.75			
	x30x108	98.44		x36x144	112.50			

We can have Sheet Steel galvanized in one day here in Chicago.

All our Sheet Steel is now rolled according to United States Standard Gauge, as shown on page 252.

Sheets cut to any desired size; extra charge for labor and waste.

WRITE FOR PRICES.

ONE PASS COLD ROLLED BOX ANNEALED SOFT STEEL SHEETS.

SIZES IN STOCK AND *ESTIMATED* WEIGHTS.

Gauge	Size	Est. Wt. Per Sheet	Gauge	Size	Est. Wt. Per Sheet	Gauge	Size	Est. Wt. Per Sheet
No. 18	x24x 96	32.	No. 22	x28x 84	20.44	No. 26	x42x120	26.25
	x24x108	36.		x28x 96	23.33		x24x 96	11.
	x24x120	40.		x28x108	26.05		x24x101	11.57
	x26x 96	34.67		x28x120	29.17		x28x 96	12.83
	x26x108	39.		x30x 96	25.		x28x101	.....
	x26x120	43.33		x30x120	31.25		x28x120	16.04
	x28x 96	37.33		x36x 96	30.		x30x 96	13.75
	x28x108	42.		x36x120	37.5		x30x101	14.47
	x28x120	46.67		x42x 96	35.		x30x120	17.19
	x30x 96	40.		x42x120	43.75	No. 28	x24x 96	10.
No. 20	x30x108	45.	No. 24	x24x 96	16.		x24x101	10.52
	x30x120	50.		x24x101	16.83		x28x 72	8.76
	x36x 96	48.		x24x120	20.		x28x 84	10.22
	x36x108	54.		x26x 96	17.33		x28x 96	11.67
	x36x120	60.		x26x101	18.24	No. 29	x28x108	13.14
	x42x 96	56.		x26x120	21.67		x28x120	14.58
	x42x120	70.		x28x 72	14.		x30x 96	12.5
	x48x 96	64.		x28x 84	16.31		x24x101	9.47
	x48x120	80.		x28x 96	18.67	No. 30	x24x 96	8.
	x24x 96	24.		x28x108	21.		x24x120	10.
	x24x120	30.		x28x120	23.33		x26x 96	8.67
	x26x 96	26.		x30x 96	20.		x26x120	10.83
	x26x120	32.5		x30x120	25.		x28x 96	9.33
	x28x 72	21.		x36x 96	24.		x28x120	11.67
	x28x 84	24.50		x36x120	30.		x30x 96	10.
	x28x 96	28.		x42x 96	28.		x30x120	12.50
	x28x108	31.50		x42x120	35.		x36x 96	12.
	x28x120	35.	No. 26	x24x 96	12.		x36x120	15.
	x30x 96	30.		x24x101	12.63	SHEET IRON. We can furnish from mills, Genuine Charcoal Iron Sheets and Muck- Bar Sheets, also genuine puddled iron sheets.		
	x30x120	37.5		x24x120	15.			
	x36x 96	36.		x26x 96	13.			
	x36x120	45.		x26x120	16.25			
	x42x 96	45.75		x28x 72	10.50			
	x42x120	52.50		x28x 84	12.			
	x48x 96	48.		x28x 96	14.			
	x48x120	60.		x28x108	15.75			
No. 22	x24x 96	20.		x28x120	17.5			
	x24x101	.....		x30x 96	15.			
	x24x120	25.		x30x120	18.75			
	x26x 96	21.67		x36x 96	18.			
	x26x120	27.08		x36x120	22.5			
	x28x 72	17.51		x42x 96	21.			

SHEET IRON.

We can furnish from
mills, Genuine Charcoal
Iron Sheets and Muck-
Bar Sheets, also genuine
puddled iron sheets.

We can have Sheet Steel galvanized in one day here in Chicago.

All our Sheet Steel is now rolled according to United States Standard

Gauge, as shown on page 252.

Sheets cut to any desired size; extra charge for labor and waste.

WRITE FOR PRICES.

GALVANIZED SHEET STEEL.—IN STOCK AND ESTIMATED WEIGHTS.

Size	Est. wt. per Sh't	Size	Est. wt. per Sh't	Size	Est. wt. per Sh't
No. 10 x30x 96	116	No. 18 x42x 96	60	No. 24 x36x120	35
x30x120	145	x42x120	75	x42x 96	32
x36x 96	139	x48x 96	69	x42x120	41
x36x120	173	x48x120	86	x48x 96	37
x42x 96	162	No. 20 x24x 96	27	x48x120	46
x42x120	202	x24x120	33	No. 26 x24x 96	15
x48x 96	185	x26x 96	29	x24x120	18
x48x120	231	x26x120	36	x26x 96	16
No. 12 x30x 96	91	x28x 72	23	x26x120	20
x30x120	113	x28x 84	27	x28x 72	12.72
x36x 96	109	x28x 96	31	x28x 84	14.84
x36x120	136	x28x108	35	x28x 96	17
x42x 96	127	x28x120	39	x28x108	19.08
x42x120	159	x30x 96	33	x28x120	21
x48x 96	145	x30x120	41	x30x 96	18
x48x120	181	x36x 96	40	x30x120	23
No. 14 x30x 96	66	x36x120	50	x36x 96	22
x30x120	82	x38x120	57	x36x120	27
x36x 96	79	x42x 96	46	x42x 96	
x36x120	98	x42x120	58	x42x120	
x42x 96	92	x48x 96	55	No. 27 x24x 96	14
x42x120	115	x48x120	68	x24x120	17
x48x 96	105	No. 22 x24x 96	23	x26x 96	15
x48x120	131	x24x120	28	x26x120	18
No. 16 x24x 96	43	x26x 96	24	x28x 96	16
x24x120	53	x26x120	30	x28x120	20
x26x 96	46	x28x 72	20	x30x 96	17
x26x120	58	x28x 84	22	x30x120	21
x28x 96	50	x28x 96	26	x36x 96	20
x28x120	62	x28x108	28	x36x120	25
x30x 96	53	x28x120	33	No. 28 x24x 96	13
x30x120	66	x30x 96	28	x24x120	16
x36x 96	64	x30x120	35	x26x 96	14
x36x120	80	x36x 96	34	x26x120	17
x42x 96	74	x36x120	42	x28x 72	11.22
x42x120	93	x42x 96	39	x28x 84	13.09
x48x 96	85	x42x120	49	x28x 96	15
x48x120	106	x48x 96	35	x28x108	16.83
No. 18 x24x 96	35	x48x120	56	x28x120	18
x24x120	43	No. 24 x24x 96	19	x30x 96	16
x26x 96	37	x24x120	23	x30x120	20
x26x120	47	x26x 96	20	x36x 96	19
x28x 72	30	x26x120	25	x36x120	23
x28x 84	35	x28x 72	17	No. 30 x24x 96	11
x28x 96	40	x28x 84	20	x24x120	13
x28x108	45	x28x 96	22	x26x 96	11
x28x120	50	x28x108	25	x26x120	14
x30x 96	43	x28x120	27	x28x 96	12
x30x120	54	x30x 96	23	x28x120	15
x36x 96	52	x30x120	29	x30x 96	13
x36x120	65	x36x 96	28	x30x120	16

Special sizes can be galvanized in one day here in Chicago.
Sheets cut to any desired size; extra charge for labor and waste.

WRITE FOR PRICES.

HIGH-GRADE SHEET STEEL.

WE CAN ALSO SUPPLY FROM MILL.

SINGLE PICKLED STEEL.

One-Pass Cold Rolled and Single Pickled, free from scale, for use where a sheet free from scale is required but where smooth finish is not essential. Specially adapted for metal lockers, etc.

FULL PICKLED, FULL COLD, ROLLED AND REANNEALED

Specially adapted to purposes requiring a clean, smooth product free from scale and scale marks.

DRAWING AND STAMPING STEELS FOR ALL PURPOSES.

To quote on this intelligently we should know the sizes and quantity of each size and the exact work that will be required of the steel; and a sample of the article to be formed up is the best means of arriving at the quality that is necessary.

LOCOMOTIVE JACKET STEEL.

For locomotive jackets and similar uses.

WELLSVILLE POLISHED.

Handsome dark blue polished product, specially adapted for high-class stoves, ranges, stovepipe, elbows, etc.

U. S. ELECTRICAL STEEL.

High-Grade Electrical Sheets for transformers and high-class electrical machines, specially prepared to show low magnetic losses with minimum aging tendencies.

AMERICAN ARMATURE.

Electrical Sheets, specially treated for Armature Works.

GENUINE CHARCOAL IRON SHEETS, ALL GAUGES.

Specially adapted to furnace work and work exposed to weather or moisture or any other purpose requiring a pure iron base sheet; will not corrode as quickly as steel.

To insure prompt and satisfactory quotations, inquiries for all above should give the sizes required and the quantity of each size and all other information, and when in doubt as to the kind of steel required should state exactly how it is to be used.

WRITE FOR PRICES.

CORRUGATED SHEETS.

PAINTED.		GALVANIZED.	
STOCK ON HAND.	Size.	STOCK ON HAND.	Size.
For Stock on Hand see our Monthly Stock List.	No. 18 x 26 x 96	For Stock on Hand see our Monthly Stock List.	No. 18 x 26 x 96
	x x 120		x x 120
	No. 20 x x 72		No. 20 x x 96
	x x 84		x x 120
	x x 96		No. 22 x x 96
	x x 108		x x 120
	x x 120		No. 24 x x 96
	No. 22 x x 72		x x 120
	x x 84		No. 26 x x 96
	x x 96		x x 108
	x x 108		x x 120
	x x 120		No. 28 x x 72
	No. 24 x x 72		x x 84
	x x 84		x x 96
	x x 96		x x 108
	x x 108		x x 120
	No. 26 x x 96		
	x x 108		
	x x 120		
	No. 28 x x 72		
	x x 84		
	x x 96		
	x x 108		
	x x 120		

Above sheets are standard $2\frac{1}{4}$ -inch corrugations and cover 24 inches of surface when placed in position, $2\frac{1}{2}$ inches being required for lap. Can also supply $1\frac{1}{4}$ -inch corrugated sheets at a slight advance in price.

TABLE OF WEIGHTS PER SQUARE.

Size	Painted.	Galvanized	Size	Painted.	Galvanized
No. 18	217 lbs.	232 lbs.	No. 26	83 lbs.	98 lbs.
20	163	178	27	76	91
22	136	151	28	68	85
24	110	124			

CORRUGATED ARCHES.

Sheets bent to any radius desired can be furnished at special prices.

PRESSED BRICK SIDING.

Description.	STOCK ON HAND.	Size.
PAINTED GALVANIZED	For stock on hand see our monthly stock list	No. 28 x 28 x 60 x 30 x 60

A Square contains 8 sheets and weighs, Painted 68 lbs., Galvanized 80 lbs.

BEADED SHEETS.

Description.	STOCK ON HAND.	Size.
PAINTED GALVANIZED	For stock on hand see our monthly stock list	No. 28 x 24 x 96 x 24 x 96

A Square contains $6\frac{1}{4}$ sheets and weighs, Painted 68 lbs., Galvanized 83 lbs.

WRITE FOR PRICES.

STEEL WEATHERBOARDING.

Description.	STOCK ON HAND.	Size.
PAINTED GALVANIZED	For Stock on Hand see our Monthly Stock List	No. 28 x 24 x 96 x 24 x 96

A Square contains $6\frac{1}{4}$ sheets and weighs, Painted 68 lbs., Galvanized 83 lbs.

PRESSED STANDING SEAM ROOFING.

PAINTED.		GALVANIZED.	
STOCK ON HAND.	Size.	STOCK ON HAND.	Size.
For Stock on Hand see our Monthly Stock List	No. 28 x 25 x 72 x x 84 x x 96 x x 108 x x 120	For Stock on Hand see our Monthly Stock List	No. 28 x 25 x 72 x x 84 x x 96 x x 108 x x 120

Laps are 1 inch high.

Weight per square, Painted 70 lbs., Galvanized 88 lbs.

Price per square includes all necessary trimmings, such as Nails ($\frac{1}{2}$ lb.), Cleats (20), Dry Paint (1 lb.).

One squeezer furnished free of charge to put on roofing providing transportation charge is paid both ways.

TWO V CRIMP ROOFING.

PAINTED.		GALVANIZED.	
STOCK ON HAND.	Size.	STOCK ON HAND.	Size.
For Stock on Hand see our Monthly Stock List	No. 26 x 24 x 96 x x 120 No. 28 x x 96 x x 120	For Stock on Hand see our Monthly Stock List	No. 26 x 24 x 96 x x 120 No. 28 x x 96 x x 120

Crimps $\frac{3}{4}$ inch high.

Weight per square, Painted 70 lbs., Galvanized 86 lbs.

Price per square includes necessary triangular wood strips (50 lineal feet)

THREE V CRIMP ROOFING.

PAINTED.		GALVANIZED.	
STOCK ON HAND.	Size.	STOCK ON HAND.	Size.
For Stock on Hand see our Monthly Stock List	No. 26 x 24 x 96 x x 120 No. 28 x x 96 x x 120	For Stock on Hand see our Monthly Stock List	No. 26 x 24 x 96 x x 120 No. 28 x x 96 x x 120

Crimps $\frac{3}{4}$ inch high.

Weight per square, Painted 70 lbs., Galvanized 86 lbs.


Price per square includes necessary triangular wood strips (100 lineal feet).

ROLL CAP ROOFING.

PAINTED.		GALVANIZED.	
STOCK ON HAND.	Size.	STOCK ON HAND.	Size.
See Stock List	No. 28 x 26 in. x 50 ft.	See Stock List	No. 28 x 26 in. x 50 ft.

WRITE FOR PRICES.

BOILER TUBES. STOCK ON HAND.

 Sizes carried in Stock are shown by check mark✓

We show below stock on hand: National Tube Co.'s Soft Steel Lap-welded Boiler Tubes, Tyler Tube & Pipe Co.'s Knobbed Charcoal Iron Lap-welded Boiler Tubes and Shelby Cold Drawn Seamless Boiler Tubes.

SIZE.				Lap-weld Steel.	Seamless Cold Drawn	Charcoal Iron.	SIZE.				Lap-weld Steel.	Seamless Cold Drawn	Charcoal Iron.	SIZE.				Lap-weld Steel.	Seamless Cold Drawn	Charcoal Iron.
Dia. In.	L'gth Ft.	In.					Dia. in.	L'gth Ft.	In.					Dia. In.	L'gth Ft.	In.				
1	x12	0		✓			2	x13	0		✓			3	x10	0		✓		✓
					✓			x14	0		✓				x11	0		✓		✓
1 $\frac{1}{4}$	x10	0		✓				x15	0		✓				x12	0		✓		✓
	x12	0		✓				x16	0		✓				x13	0		✓		✓
	x14	0		✓				x18	0		✓				x14	0		✓		✓
1 $\frac{1}{2}$	x 6	0		✓				x20	0		✓				x15	0		✓		✓
	x10	0		✓			2 $\frac{1}{4}$	x10	0		✓				x16	0		✓		✓
	x12	0		✓				x12	0		✓				x18	0		✓		✓
	x14	0		✓				x14	0		✓				x20	0		✓		✓
	x16	0		✓				x16	0		✓									
								x18	0		✓									
								x20	0		✓									
1 $\frac{3}{4}$	x 2	0		✓										3 $\frac{1}{4}$	x10	0		✓		
	x 3	0					2 $\frac{1}{2}$	x 3	0		✓				x12	0		✓		
	x 3	6		✓				x 4	0		✓				x14	0		✓		
	x 4	0		✓				x 5	0		✓				x16	0		✓		
	x 5	0		✓				x 6	0		✓			3 $\frac{1}{2}$	x10	0		✓		✓
	x 6	0		✓				x 6	6		✓				x12	0		✓		✓
	x 7	0		✓				x 7	0		✓				x13	0		✓		✓
	x 8	0		✓				x 7	6		✓				x14	0		✓		✓
	x10	0		✓				x 8	0		✓				x16	0		✓		✓
	x12	0		✓				x 9	0		✓				x18	0		✓		✓
	x14	0		✓				x10	0		✓				x20	0		✓		✓
	x15	0		✓				x12	0		✓			4	x12	0		✓		✓
	x16	0		✓				x14	0		✓				x14	0		✓		✓
	x18	0		✓				x16	0		✓				x15	0		✓		✓
	x20	0						x18	0		✓				x16	0		✓		✓
2	x 2	0		✓		✓		x20	0		✓				x18	0		✓		✓
	x 2	6		✓		✓	2 $\frac{3}{4}$	x 9	0				✓		x20	0		✓		✓
	x 3	0		✓		✓		x10	0		✓				x21	0		✓		✓
	x 3	6		✓		✓		x12	0		✓				x22	0		✓		✓
	x 4	0		✓		✓		x14	0		✓			4 $\frac{1}{2}$	x12	0				
	x 4	6		✓		✓		x16	0		✓				x16	0		✓		
	x 5	0		✓		✓		x18	0		✓				x18	0		✓		✓
	x 5	6		✓		✓		x18	0		✓				x20	0		✓		✓
	x 6	0		✓		✓								5	x16	0		✓		
	x 6	6		✓		✓									x18	0		✓		
	x 7	0		✓		✓	3	x 4	0		✓				x20	0		✓		
	x 7	6		✓		✓		x 5	0		✓									
	x 8	0		✓		✓		x 6	0		✓				6	x18	0		✓	
	x 9	0		✓		✓		x 7	0		✓					x20	0		✓	
	x10	0		✓		✓		x 7	6		✓									
	x11	0		✓		✓		x 8	0		✓									
	x12	0		✓		✓		x 9	0		✓									

WRITE FOR DISCOUNTS.

COLD DRAWN SEAMLESS BOILER TUBES.

These tubes are made from the best quality of Open Hearth Steel. In the process of manufacture there is never a welding heat employed, and from the billet to the finished hot tube but one heat is used. The tubes are accurate gauge, perfectly round and smooth as a piece of polished steel. After the cold drawing process through which these tubes pass, thereby densifying or compacting the metal, they are annealed the entire length and can readily be expanded, flanged and beaded without showing the least fracture. Owing to their accuracy and smoothness they can be put into a boiler with a labor saving of 10%, and they have no seams to open. Each tube is tested to 1,000 lbs. hydrostatic pressure. They are now used exclusively by the U. S. Government and by the navies of all foreign countries.

PRICE LIST OF BOILER TUBES.

Taking effect January 1, 1908.

Outside Diameter Inches.	PRICE (per foot.)	Thickness nearest Birgm. W. G.	Nominal Weight per Foot.	EXTRA GAUGES								
				PRICE PER FOOT								
				LAPWELDED AND SEAMLESS STEEL TUBES				IRON BOILER TUBES				
Outside Diam- eter, Inches.	One Extra Wire Gauge.	Two Extra Wire Gauges.	Three Extra Wire Gauges.	Four Extra Wire Gauges.	One Extra Wire Gauge.	Two Extra Wire Gauges.	Three Extra Wire Gauges.	Four Extra Wire Gauges.				
1	\$0.30	13	0.90	1	\$0.35	\$0.38	\$0.42	\$0.45	\$0.35	\$0.38	\$0.42	\$0.45
1 1/4	.28	13	1.15	1 1/4	.33	.36	.39	.43	.33	.36	.39	.43
1 1/2	.27	13	1.40	1 1/2	.32	.34	.38	.42	.32	.34	.38	.42
1 3/4	.22	13	1.66	1 3/4	.26	.28	.31	.34	.26	.30	.33	.36
2	.20	13	1.91	2	.23	.26	.28	.31	.24	.28	.32	.36
2 1/4	.24	13	2.16	2 1/4	.27	.31	.34	.37	.29	.33	.37	.40
2 1/2	.28	13	2.75	2 1/2	.31	.35	.38	.42	.34	.39	.44	.49
2 3/4	.34	12	3.04	2 3/4	.38	.42	.46	.51	.41	.47	.54	.60
3	.35	12	3.33	3	.39	.43	.48	.53	.42	.49	.56	.63
3 1/4	.40	11	3.96	3 1/4	.45	.50	.55	.60	.48	.55	.63	.70
3 1/2	.44	11	4.28	3 1/2	.49	.55	.61	.66	.53	.61	.69	.77
3 3/4	.50	11	4.60	3 3/4	.58	.65	.71	.80	.59	.68	.76	.85
4	.55	10	5.47	4	.61	.68	.74	.83	.65	.74	.83	.92
4 1/4	.62	10	6.17	4 1/4	.69	.77	.83	.93	.73	.83	.94	1.04
5	.75	9	7.58	5	.86	.93	1.04	1.13	.87	.99	1.09	1.22
6	1.00	8	10.16	6	1.12	1.26	1.36	1.47	1.12	1.26	1.36	1.47
7	1.20	8	11.90	7	1.32	1.48	1.60	1.72	1.32	1.48	1.60	1.72
8	1.50	8	13.65	8	1.65	1.86	2.02	2.17	1.65	1.86	2.02	2.17
9	1.70	7	16.76	9	1.91	2.07	2.23	2.42	1.91	2.07	2.23	2.42
10	2.10	6	21.00	10	2.30	2.49	2.70	2.95	2.30	2.49	2.70	2.95
11	2.50	5	25.00	11	2.74	2.98	3.26	3.43	2.74	2.98	3.20	3.43
12	2.90	4 1/2	28.50	12	3.12	3.40	3.65	4.00	3.12	3.40	3.65	4.00
13	3.20	4	32.06	13	3.53	3.86	4.07	4.60	3.53	3.86	4.07	4.60

Write for special prices
on larger sizes.

Write for special prices on larger sizes.

Prices for swaging ends, swelling and upsetting tubes, will be furnished on application.

2 1/4 inch and smaller over 18 feet, 10 per cent net extra.
2 1/2 inch and larger over 22 feet, 10 per cent net extra.

WRITE FOR DISCOUNTS.



CONE HEAD CLIMAX BOILER RIVETS. IN STOCK.



Sizes carried in Stock are shown by check mark ✓

Length of Rivet	Diameter of Rivet in Inches					
	1-2	5-8	11-16	3-4	7-8	1
$\frac{3}{4}$ in.	✓	✓
$\frac{7}{8}$	✓	✓
1	✓	✓
$1\frac{1}{8}$	✓	✓	✓	✓	✓	..
$1\frac{1}{4}$	✓	✓	✓	✓	✓	..
$1\frac{3}{8}$	✓	✓	✓	✓	✓	..
$1\frac{1}{2}$	✓	✓	✓	✓	✓	..
$1\frac{5}{8}$	✓	✓	✓	✓	✓	..
$1\frac{3}{4}$	✓	✓	✓	✓	✓	..
$1\frac{7}{8}$	✓	✓	✓	✓	✓	..
2	✓	✓	✓	✓	✓	✓
$2\frac{1}{8}$	✓	✓	✓	✓	✓	✓
$2\frac{1}{4}$	✓	✓	✓	✓	✓	✓
$2\frac{3}{8}$	✓	✓	✓	✓	✓	✓
$2\frac{1}{2}$	✓	✓	✓	✓	✓	✓
$2\frac{5}{8}$	✓	✓	✓	✓	✓	✓
$2\frac{3}{4}$	✓	✓	✓	✓	✓	✓
$2\frac{7}{8}$	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓
$3\frac{1}{4}$	✓	✓	✓	✓	✓	✓
$3\frac{1}{2}$	✓	✓	✓	✓	✓	✓
$3\frac{3}{4}$	✓	✓	✓	✓	✓	✓
$3\frac{7}{8}$	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
$4\frac{1}{4}$..	✓	✓	✓	✓	✓
$4\frac{1}{2}$..	✓	✓	✓	✓	✓
$4\frac{3}{4}$..	✓	✓	✓	✓	✓
5	..	✓	✓	✓	✓	✓
$5\frac{1}{4}$..	✓	✓	✓	✓	✓
$5\frac{1}{2}$..	✓	✓	✓	✓	✓
$5\frac{3}{4}$..	✓	✓	✓	✓	✓
6	..	✓	✓	✓	✓	✓
$6\frac{1}{4}$..	✓	✓	✓	✓	✓
$6\frac{1}{2}$..	✓	✓	✓	✓	✓
7	✓	..	✓
$7\frac{1}{2}$	✓	..	✓
8	✓	..	✓

Rivets are now carried in stock in 200-lb. kegs. The length of a rivet is the distance under the head. See page 281 for table showing number of rivets in 100 lbs.

MILL EXTRAS ON RIVETS.

$\frac{3}{4}$ -inch to $1\frac{1}{4}$ inch diameter, inclusive, 1 inch and over in length, base price.

$\frac{1}{2}$ inch and $\frac{7}{8}$ inch diameter, 50c per 100 lbs.

$\frac{5}{8}$ inch diameter and $1\frac{1}{8}$ inch diameter, 15c per 100 lbs.

Lengths shorter than 1 inch, 50c per 100 lbs.

Countersunk Heads, in quantities of less than 1,000 lbs. of one diameter and length, 25c per 100 lbs.

Flat Head Rivets, 25c per 100 lbs.

Rivets packed in 100-lb. kegs, 10c per 100 lbs.

SPECIAL EXTRAS.

All Cone Head Rivets to be charged price of Boiler Rivets.

Rivets when 5 inches long and over when ordered in lots of 1,000 lbs. or less than 1,000 lbs., 25c per 100 lbs.

STRUCTURAL RIVETS BUTTON OR ROUND HEAD IN STOCK.

Length of Rivet	Diameter of Rivets in Inches					Length of Rivet	Diameter of Rivet in Inches				
	1-2	5-8	3-4	7-8	1		1-2	5-8	3-4	7-8	1
1	✓	✓	✓	3	✓	✓	✓	✓	...
1 $\frac{1}{8}$	✓	✓	...	✓	...	3 $\frac{1}{4}$	✓	...	...	✓	...
1 $\frac{1}{4}$	✓	✓	✓	✓	...	3 $\frac{1}{2}$	✓	✓	✓	✓	✓
1 $\frac{3}{8}$	✓	✓	✓	3 $\frac{3}{4}$	...	...	✓	✓	...
1 $\frac{1}{2}$	✓	✓	✓	3 $\frac{7}{8}$	...	...	✓	...	...
1 $\frac{5}{8}$	✓	✓	✓	4	✓	✓	✓	✓	✓
1 $\frac{3}{4}$	✓	✓	✓	✓	...	4 $\frac{1}{4}$	...	✓	✓	✓	...
1 $\frac{7}{8}$	✓	✓	✓	✓	...	4 $\frac{1}{2}$	...	...	✓	✓	✓
2	✓	✓	✓	✓	...	4 $\frac{3}{4}$	...	...	✓	...	...
2 $\frac{1}{8}$...	✓	✓	5	✓	✓	✓	✓	✓
2 $\frac{1}{4}$	✓	✓	✓	✓	...	5 $\frac{1}{4}$	...	...	...	✓	...
2 $\frac{3}{8}$	✓	...	✓	5 $\frac{1}{2}$	...	...	...	✓	...
2 $\frac{1}{2}$	✓	✓	✓	✓	...	5 $\frac{3}{4}$	...	...	...	...	✓
2 $\frac{5}{8}$	✓	✓	✓	✓	...	6	...	...	...	...	...
2 $\frac{3}{4}$	✓	✓	✓	✓	✓	6 $\frac{1}{4}$	...	...	...	...	...
2 $\frac{7}{8}$	✓	✓	...	6 $\frac{1}{2}$	...	✓	...	...	...

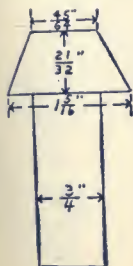
STANDARD HEADS FOR RIVETS.

CONE HEAD.—Least diameter, $\frac{15}{16}$ times diameter of rivet shank. Greatest diameter, $1\frac{3}{4}$ times diameter of rivet shank. Height, $\frac{7}{8}$ times diameter of rivet shank.

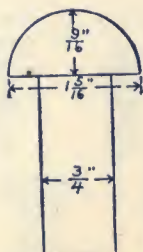
BUTTON HEAD.—Diameter, $1\frac{3}{4}$ times diameter of rivet shank. Height, $\frac{3}{4}$ times diameter of rivet shank.

STEEPLE HEAD.—Diameter, 2 times diameter of rivet shank. Height, equal to diameter of rivet shank.

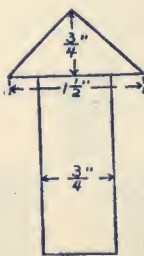
COUNTERSUNK.—Height, $\frac{1}{2}$ times diameter of rivet shank. 80 degrees taper.



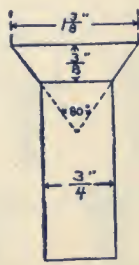
Cone



Button or Round




Steeple

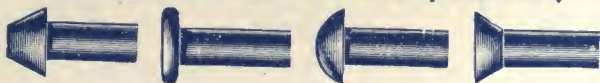


Countersunk

WRITE FOR PRICES.

NORWAY SHEET AND TANK RIVETS. IN STOCK

 Sizes carried in Stock are shown by check mark ✓



Length of Rivets	CONE HEAD				FLAT HEAD			ROUND HEAD						Counter-sunk Head	
	Diam. of Rivets				Dia. of Rivets			Diameter of Rivets						Dia. of Riv.	
	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{8}$	$\frac{3}{8}$
$\frac{1}{4}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$\frac{3}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$\frac{1}{2}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$\frac{5}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$\frac{3}{4}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$\frac{7}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$1\frac{1}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$1\frac{1}{4}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$1\frac{3}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$1\frac{1}{2}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$1\frac{5}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$1\frac{3}{4}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$2\frac{1}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$2\frac{1}{4}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$2\frac{3}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$2\frac{1}{2}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
$2\frac{5}{8}$	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



POUND RIVETS

(FLAT HEAD).

IN STOCK.



SIZE			DIMENSIONS			SIZE			DIMENSIONS			SIZE			DIMENSIONS		
Wt. per M	Diam.	Length	Wt. per M	Diam.	Length	Wt. per M	Diam.	Length	Wt. per M	Diam.	Length	Wt. per M	Diam.	Length	Wt. per M	Diam.	Length
2 lbs.	.140	$\frac{11}{16}$	6 lbs.	.200	$\frac{25}{64}$	10 lbs.	.233	$\frac{15}{16}$	2 lbs.	.140	$\frac{11}{16}$	6 lbs.	.200	$\frac{25}{64}$	10 lbs.	.233	$\frac{15}{16}$
$2\frac{1}{2}$ "	.147	$\frac{3}{4}$	7 "	.215	$\frac{1}{4}$	12 "	.253	$\frac{1}{2}$	2 1/2 "	.147	$\frac{3}{4}$	7 "	.215	$\frac{1}{4}$	12 "	.253	$\frac{1}{2}$
3 "	.160	$\frac{15}{16}$	8 "	.225	$\frac{11}{16}$	14 "	.275	$\frac{5}{8}$	3 "	.160	$\frac{15}{16}$	8 "	.225	$\frac{11}{16}$	14 "	.275	$\frac{5}{8}$
4 "	.173	$\frac{1}{2}$	9 "	.230	$\frac{3}{4}$	16 "	.293	$\frac{3}{4}$	4 "	.173	$\frac{1}{2}$	9 "	.230	$\frac{3}{4}$	16 "	.293	$\frac{3}{4}$
5 "	.185	$\frac{3}{8}$							5 "	.185	$\frac{3}{8}$						

We can furnish from mills odd and special rivets of all kinds.



WRITE FOR PRICES.

STRUCTURAL MATERIAL.

We now have a large stock of all sizes I Beams, Channels, Angles, Tees, Zees and Universal Plates in our new steel warehouse, which with our equipment of high-speed friction saws, cold saws, angle, bar and plate shears, enables us to furnish this material cut to any length desired, as promptly as other materials. We can usually ship same day order is received.

PRICE LIST.

EXTRAS ON BEAMS AND CHANNELS.

	In effect June 1, 1899.	Per cwt.
I Beams and Channels, 3 in. to 15 in., inclusive, cut 3 ft. or longer.....	Base.	
I Beams, 18 in., 20 in. and 24 in., cut 3 ft. or longer.		\$0.10
Angles, Tees and Zees, 3 x 2 x $\frac{1}{4}$ and thicker to 6 x 6 in., inclusive, cut 3 ft. or longer.....	Base.	
Angles, Tees and Zees, larger than 6 in. on one or both legs.....	extra	.10
For cutting under 3 ft. to 2 ft.....	extra	.25
Under 2 ft. to 1 ft.....	extra	.50
Under 1 ft.....	extra	1.55
For cutting to measure with less variation than plus or minus $\frac{3}{8}$ in.....		.15
Plain punching one size hole in web only. ....		.15
Flange only.....		.15
Both web and flange.....		.25
Each additional size hole .....		.15
Assembling into girders.....		.35
Coping, fitting ends, including cutting to exact length, with or without punching, also including the riveting or bolting of connection plates or connection angles.....	Shop rates.	
Mitreing, per mitre	50 cts. to 1.00	
Painting or oiling one coat with ordinary paint or oil.....		.10
Bending or other unusual work.....	Shop rates.	
Cambering beams and channels for ships or other purposes .....		.25
Fittings, whether loose or attached, such as angle connections, bolts, separators, tie rods, splice plates, etc.....		1.55

See following pages for sizes in stock.



STEEL I BEAMS. IN STOCK.



	Size in.	Wt. lbs.	Length ft.		Size in.	Wt. lbs.	Length ft.		Size in.	Wt. lbs.	Length ft.
For Stock on Hand see our Monthly Stock List.	3	5½	3 to 40	For Stock on Hand see our Monthly Stock List.	8	23	3 to 60	For Stock on Hand see our Monthly Stock List.	12	55	3 to 60
	3	7½	40		8	25½	60		15	42	60
	4	7½	40		9	21	60		15	50	60
	4	10½	40		9	25	60		15	60	60
	5	9¾	60		9	30	60		15	70	60
	5	12¾	60		9	35	60		15	80	60
	5	14¾	60		10	25	60		18	55	60
	6	12¾	60		10	30	60		18	70	60
	6	14¾	60		10	35	60		20	65	60
	6	17¾	60		10	40	60		20	80	60
For Stock on Hand see our Monthly Stock List.	7	15	60	For Stock on Hand see our Monthly Stock List.	12	31½	60	For Stock on Hand see our Monthly Stock List.	20	100	60
	7	17½	60		12	35	60		24	80	60
	7	20	60		12	40	60		24	100	60
	8	18	60		12	45	60				
	8	20½	60		12	50	60				

For Price List see page 36.



STEEL CHANNELS. IN STOCK.



	Size in.	Wt. lbs.	Length ft.		Size in.	Wt. lbs.	Length ft.		Size in.	Wt. lbs.	Length ft.
For Stock on Hand see our Monthly Stock List.	3	4	3 to 40	For Stock on Hand see our Monthly Stock List.	7	14¾	3 to 60	For Stock on Hand see our Monthly Stock List.	10	25	3 to 60
	3	6	40		7	17¼	60		10	30	60
	4	5¼	40		7	19¾	60		10	35	60
	4	6¼	40		8	11¼	60		12	20½	60
	4	7¼	40		8	13¾	60		12	25	60
	5	6½	60		8	16¼	60		12	30	60
	5	9	60		8	18¾	60		12	35	60
	5	11½	60		8	21¼	60		12	40	60
	6	8	60		9	13¼	60		13	32	60
	6	10½	60		9	15	60		15	33	60
For Stock on Hand see our Monthly Stock List.	6	13	60	For Stock on Hand see our Monthly Stock List.	9	20	60	For Stock on Hand see our Monthly Stock List.	15	40	60
	6	15½	60		9	25	60		15	45	60
	7	9¾	60		10	15	60		15	50	60
	7	12¾	60		10	20	60		15	55	60

For Price List see page 36.

Beams and Channels cut to any length 3 feet or longer without extra charge. Under 3 feet subject to extras.

WRITE FOR PRICES.



STEEL FILLET ANGLES— EQUAL LEG. IN STOCK.



Size, inches	Est. Wt. per ft.	Length, ft.	Size, inches	Est. Wt. per ft.	Length, ft.	Size, inches	Est. Wt. per ft.	Length, ft.
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$	0.4	18 and 20	2 x 2 x $\frac{1}{8}$	1.7	20 and 25	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{8}$	8.5	3 to 60
$\frac{5}{8} \times \frac{5}{8} \times \frac{1}{8}$	0.5	18 and 20	2 x 2 x $\frac{1}{16}$	2.5	28 and 30	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{4}$	9.8	60
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$	0.6	18 and 20	2 x 2 x $\frac{1}{4}$	3.2	28 and 30	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	11.1	60
$\frac{7}{8} \times \frac{7}{8} \times \frac{1}{8}$	0.7	18 and 20	2 x 2 x $\frac{3}{8}$	4.0	28 and 30	4 x 4 x $\frac{1}{8}$	8.2	60
$\frac{7}{8} \times \frac{7}{8} \times \frac{1}{4}$	1.0	18 and 20	2 x 2 x $\frac{3}{8}$	4.7	28 and 30	4 x 4 x $\frac{3}{8}$	9.8	60
1 x 1 x $\frac{1}{8}$	0.8	18 and 20	2 x 2 x $\frac{1}{2}$	5.4	28 and 30	4 x 4 x $\frac{1}{2}$	11.3	60
1 x 1 x $\frac{1}{16}$	1.2	18 and 20	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$	3.7	28 and 30	4 x 4 x $\frac{1}{2}$	12.8	60
1 x 1 x $\frac{1}{4}$	1.5	18 and 20	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{8}$	4.5	28 and 30	4 x 4 x $\frac{5}{8}$	15.7	60
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{8}$	1.1	18 and 20	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{8}$	2.1	28 and 30	4 x 4 x $\frac{3}{4}$	18.5	60
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{16}$	1.5	20 and 25	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{16}$	3.1	28 and 30	5 x 5 x $\frac{3}{8}$	12.3	60
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{4}$	2.0	20 and 25	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$	4.1	28 and 30	5 x 5 x $\frac{1}{2}$	16.2	60
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$	1.2	20 and 25	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{8}$	5.0	28 and 30	5 x 5 x $\frac{5}{8}$	20.0	60
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{16}$	1.8	20 and 25	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{16}$	5.9	28 and 30	6 x 6 x $\frac{3}{8}$	14.9	60
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{4}$	2.4	20 and 25	3 x 3 x $\frac{1}{8}$	2.4	28 and 30	6 x 6 x $\frac{1}{2}$	17.2	60
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{8}$	2.9	20 and 25	3 x 3 x $\frac{1}{16}$	3.6	28 and 30	6 x 6 x $\frac{5}{8}$	19.6	60
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	3.4	20 and 25	3 x 3 x $\frac{1}{4}$	4.9	3 to 60	6 x 6 x $\frac{3}{4}$	24.2	60
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{1}{8}$	1.4	20 and 25	3 x 3 x $\frac{3}{8}$	6.1	60	6 x 6 x $\frac{7}{8}$	28.7	60
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{1}{16}$	2.2	20 and 25	3 x 3 x $\frac{1}{2}$	7.2	60	6 x 6 x $\frac{7}{8}$	33.1	60
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{1}{4}$	2.8	20 and 25	3 x 3 x $\frac{3}{4}$	8.3	60	8 x 8 x $\frac{1}{2}$	26.4	60
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{3}{8}$	3.4	20 and 25	3 x 3 x $\frac{1}{2}$	9.4	60	8 x 8 x $\frac{3}{4}$	38.9	60
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{1}{2}$	4.0	20 and 25	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{8}$	7.2	60	8 x 8 x $\frac{1}{2}$	45.0	60

STEEL FILLET ANGLES—UNEQUAL LEG. IN STOCK.

Size, inches	Est. Wt. per ft.	Length, ft.	Size, inches	Est. Wt. per ft.	Length, ft.
1 x $\frac{5}{8}$ x $\frac{1}{8}$	.7	18 and 20	4 x 3 x $\frac{3}{8}$	8.5	3 to 60
$1\frac{1}{8}$ x $\frac{1}{2}$ x $\frac{1}{8}$	.9	18 and 20	4 x 3 x $\frac{1}{4}$	9.8	60
2 x $1\frac{1}{2}$ x $\frac{1}{8}$	2.2	28 and 30	4 x 3 x $\frac{1}{2}$	11.1	60
2 x $1\frac{1}{2}$ x $\frac{1}{4}$	2.8	28 and 30	5 x 3 x $\frac{1}{8}$	8.2	60
$2\frac{1}{2}$ x 2 x $\frac{1}{8}$	2.8	28 and 30	5 x 3 x $\frac{3}{8}$	9.8	60
$2\frac{1}{2}$ x 2 x $\frac{1}{4}$	3.7	28 and 30	5 x 3 x $\frac{1}{2}$	12.8	60
$2\frac{1}{2}$ x 2 x $\frac{3}{8}$	4.5	28 and 30	5 x $3\frac{1}{2}$ x $\frac{1}{8}$	8.7	60
$2\frac{1}{2}$ x 2 x $\frac{1}{2}$	5.3	28 and 30	5 x $3\frac{1}{2}$ x $\frac{3}{8}$	10.4	60
3 x 2 x $\frac{1}{8}$	3.1	3 to 60	5 x $3\frac{1}{2}$ x $\frac{1}{2}$	12.8	60
3 x 2 x $\frac{1}{4}$	4.1	60	5 x $3\frac{1}{2}$ x $\frac{3}{4}$	13.6	60
3 x 2 x $\frac{3}{8}$	5.0	60	5 x $3\frac{1}{2}$ x $\frac{1}{2}$	16.8	60
3 x 2 x $\frac{1}{2}$	5.9	60	5 x 4 x $\frac{3}{8}$	11.0	60
3 x $2\frac{1}{2}$ x $\frac{1}{4}$	4.5	60	6 x $3\frac{1}{2}$ x $\frac{3}{8}$	11.7	60
3 x $2\frac{1}{2}$ x $\frac{3}{8}$	5.6	60	6 x $3\frac{1}{2}$ x $\frac{1}{2}$	13.5	60
3 x $2\frac{1}{2}$ x $\frac{1}{2}$	6.6	60	6 x $3\frac{1}{2}$ x $\frac{3}{4}$	15.3	60
$3\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{1}{4}$	4.9	60	6 x $3\frac{1}{2}$ x $\frac{1}{2}$	18.9	60
$3\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{3}{8}$	6.1	60	6 x 4 x $\frac{3}{8}$	12.3	60
$3\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{1}{2}$	7.2	60	6 x 4 x $\frac{1}{4}$	14.3	60
$3\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{3}{4}$	9.4	60	6 x 4 x $\frac{1}{2}$	16.2	60
$3\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{1}{2}$	11.5	60	6 x 4 x $\frac{3}{8}$	20.0	60
$3\frac{1}{2}$ x 3 x $\frac{1}{8}$	6.6	60	6 x 4 x $\frac{3}{4}$	23.6	60
$3\frac{1}{2}$ x 3 x $\frac{3}{8}$	7.8	60	7 x $3\frac{1}{2}$ x $\frac{1}{2}$	17.0	60
$3\frac{1}{2}$ x 3 x $\frac{1}{2}$	10.2	60	8 x 6 x $\frac{3}{4}$	33.8	60
4 x 3 x $\frac{1}{8}$	7.2	60			

Sizes not carried in stock can be shipped promptly from mills.

For classification, see page 236.

The above Angles can be galvanized in 24 hours after receipt of order. The above Angles cut to lengths wanted at an additional price per pound. We carry all the above in 20-ft. to 60-ft. lengths; mostly 20 to 30 ft.

WRITE FOR PRICES.



STEEL TEES. IN STOCK.

Size	Est. Wt. per ft. lbs.	Size	Est. Wt. per ft. lbs.	Size	Est. Wt. per ft. lbs.
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$	0.6	2 $\times 2 \times \frac{1}{4}$	3.7	$3\frac{1}{2} \times 3 \times \frac{3}{8}$	8.7
$\frac{7}{8} \times \frac{7}{8} \times \frac{1}{8}$	0.7	2 $\times 2 \times \frac{5}{16}$	4.4	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{3}{8}$	9.3
1 $\times 1 \times \frac{1}{8}$	1.0	$2\frac{1}{4} \times 2\frac{1}{4} \times \frac{1}{4}$	4.2	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	11.9
1 $\times 1 \times \frac{3}{16}$	1.3	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$	6.5	$3\frac{1}{2} \times 4 \times \frac{3}{8}$	10.0
$1\frac{1}{8} \times 1\frac{1}{8} \times \frac{3}{16}$	1.5	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{8}$	6.5	4 $\times 3 \times \frac{3}{8}$	9.3
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{16}$	1.7	$2\frac{1}{2} \times 3 \times \frac{5}{16}$	6.2	4 $\times 4 \times \frac{3}{8}$	10.9
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{4}$	2.1	3 $\times 2\frac{1}{2} \times \frac{5}{16}$	6.2	4 $\times 4 \times \frac{1}{2}$	13.9
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$	2.0	3 $\times 3 \times \frac{5}{16}$	6.8	4 $\times 5 \times \frac{3}{8}$	12.3
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{4}$	2.6	3 $\times 3 \times \frac{3}{8}$	7.9	4 $\times 5 \times \frac{1}{2}$	15.7
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{3}{16}$	3.0	3 $\times 3 \times \frac{7}{16}$	9.0	$4\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{8}$	9.3
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{1}{4}$	3.2	3 $\times 3\frac{1}{2} \times \frac{3}{8}$	8.6	$4\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	15.9
2 $\times 1\frac{1}{2} \times \frac{1}{4}$	3.2				

For Stock on Hand see our Monthly Stock List.

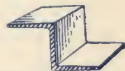
For Stock on Hand see our Monthly Stock List.

For Stock on Hand see our Monthly Stock List.

Bars are 20 feet long or over.

For Tees under $3 \times \frac{5}{16}$ in. see Classification, page 237.Tees $3 \times \frac{5}{16}$ in. and over see Price List, page 36.

STEEL "Z" BARS. IN STOCK.



Size	Est. Wt. per ft., lbs.	Size	Est. Wt. per ft., lbs.
3 in. $\times \frac{1}{4}$ thk.	6.7	5 in. $\times \frac{3}{8}$ thk.	13.9
3 $\times \frac{5}{16}$	8.4	5 $\times \frac{7}{16}$	16.4
3 $\times \frac{3}{8}$	9.7	5 $\times \frac{1}{2}$	17.9
4 $\times \frac{1}{4}$	8.2	6 $\times \frac{3}{8}$	15.6
4 $\times \frac{5}{16}$	10.3	6 $\times \frac{7}{16}$	18.3
4 $\times \frac{3}{8}$	12.4	6 $\times \frac{1}{2}$	21.0
5 $\times \frac{5}{16}$	11.6		

For Stock on Hand see our Monthly Stock List.

For Stock on Hand see our Monthly Stock List.

Bars are 15 feet long or over. See Price List, page 36.

LIGHT OR GROOVED CHANNELS.



IN STOCK.

Size	Est. Wt. per ft. lbs.	Lgth. in ft.	Price	Size	Est. Wt. per ft. lbs.	Lgth. in ft.	Price
$\frac{1}{2} \times \frac{1}{4} \times \frac{1}{8}$	.28	18	Ex. \$3.20	$1\frac{1}{2} \times \frac{1}{2} \times \frac{1}{8}$	1.12	18	Ex. \$0.30
$\frac{5}{8} \times \frac{1}{4} \times \frac{1}{8}$	.35	18	Ex. .20	$1\frac{1}{2} \times \frac{1}{2} \times \frac{3}{16}$	1.35	18	Ex. .20
$\frac{3}{4} \times \frac{1}{4} \times \frac{1}{8}$	.47	18	Ex. .60	$1\frac{1}{2} \times \frac{3}{4} \times \frac{1}{8}$	1.32	18	Ex. .20
$\frac{3}{4} \times \frac{3}{8} \times \frac{1}{8}$	.53	18	Ex. .60	$1\frac{3}{4} \times \frac{1}{2} \times \frac{3}{16}$	1.55	18	Ex. .20
$\frac{7}{8} \times \frac{3}{8} \times \frac{1}{8}$	.65	18	Ex. .50	$1\frac{1}{2} \times \frac{1}{2} \times \frac{1}{4}$	1.67	18	Ex. .20
$\frac{7}{8} \times \frac{1}{2} \times \frac{1}{8}$	.72	18	Ex. .50	2 $\times \frac{1}{2} \times \frac{3}{16}$	1.75	18	Ex. .20
1 $\times \frac{3}{8} \times \frac{1}{8}$	.76	18	Ex. .40	2 $\times \frac{3}{8} \times \frac{1}{4}$	2.32	18	Ex. .20
1 $\times \frac{1}{2} \times \frac{1}{8}$	.82	18	Ex. .40	2 $\times 1 \times \frac{3}{16}$	2.50	18	Ex. .20
$1\frac{1}{8} \times \frac{1}{2} \times \frac{1}{8}$	1.16	18	Ex. .30	2 $\times 1 \times \frac{1}{4}$	2.60	18	Ex. .20
$1\frac{1}{4} \times \frac{1}{2} \times \frac{1}{8}$	1.01	18	Ex. .40	$2\frac{1}{2} \times \frac{5}{8} \times \frac{3}{16}$	2.27	18	Ex. .20
$1\frac{1}{4} \times \frac{1}{2} \times \frac{3}{16}$	1.18	18	Ex. .30				

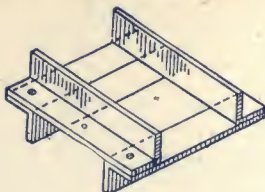
For Stock on Hand see our Monthly Stock List.

For Stock on Hand see our Monthly Stock List.

Sizes not carried in stock can be shipped promptly from mills.

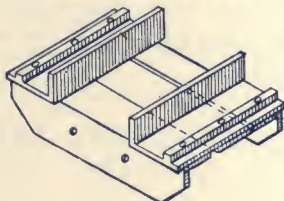
WRITE FOR PRICES.

WROUGHT STEEL POST COLLARS.



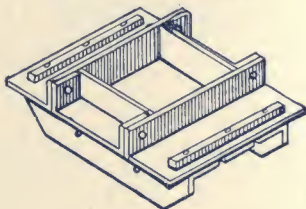
8x 8 Post.....	\$5.60
10x10 ".....	6.20
12x12 ".....	6.80
14x14 ".....	7.40
16x16 ".....	8.00

TWO WAY POST CAPS. WROUGHT STEEL



8x 8 Post.....	\$5.00
10x10 ".....	6.00
12x12 ".....	7.00
14x14 ".....	8.00
16x16 ".....	9.00

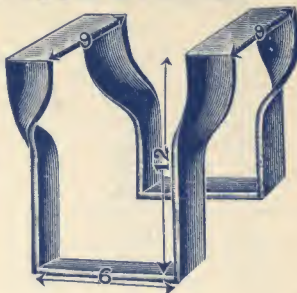
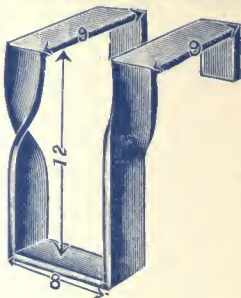
FOUR WAY POST CAPS. WROUGHT STEEL



8x 8 Post.....	\$ 7.00
10x10 ".....	8.50
12x12 ".....	10.00
14x14 ".....	12.00
16x16 ".....	13.00

WRITE FOR DISCOUNTS.

SINGLE AND DOUBLE STIRRUPS.



This Hanger is the strongest and safest in the market. It is made of Universal rolled steel bars, heated to a uniform heat, bent and left to cool. This process takes all the brittleness out of the steel and leaves it **SOFT AND ELASTIC**.

Manufactured to fill requirements.

They are made of any size material from $2\frac{1}{8}$ to $4\frac{3}{4}$ in., enabling the architect to specify size material for strength required, thus suiting any condition. The bends are made with round corners and not sharp, thus adding strength to hangers and not taking away strength, as is the case with square corner hangers.

In giving size of stirrup, start at bottom, go up, then over; i. e., if your joist is $6'' \times 12''$ and you desire to have $9''$ girder bearing, your order would read $6'' \times 12'' \times 9''$.

On request we follow your detailed instructions as to the surfacing or dressing of your timber framing, thereby assuring a proper fit.

Always notify us as to whether you desire your joists to frame above girder tops, allowing for shrinkage, or otherwise.

LIST PRICES.

Sizes	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{4}$	Sizes	$2\frac{1}{8}$	$2\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	$4\frac{3}{4}$
2x 8x 2	\$0.40	\$0.44	\$0.43	\$0.46	6x 8x 6	\$0.63	\$0.78	\$0.68	\$0.90	\$1.06	\$1.22
2x 8x 4	.44	.52	.51	.54	6x10x 6	.70	.84	.74	1.05	1.16	1.32
2x10x 2	.44	.52	.51	.54	6x12x 6	.80	1.00	.82	1.10	1.25	1.46
2x10x 4	.50	.58	.57	.60	6x12x 9	.89	1.12	.91	1.22	1.42	1.60
2x12x 2	.50	.58	.57	.60	6x14x 6	.88	1.10	.90	1.20	1.36	1.56
2x12x 4	.56	.65	.63	.68	6x14x 8	.92	1.14	.94	1.26	1.47	1.68
2x12x 6	.62	.72	.70	.74	6x14x10	.96	1.18	.98	1.32	1.58	1.80
2x14x 2	.56	.65	.63	.68	6x16x 6	.92	1.14	.94	1.26	1.47	1.68
2x14x 4	.62	.72	.70	.74	6x16x 8	.96	1.18	.98	1.32	1.58	1.80
2x14x 6	.70	.78	.77	.80	6x16x10	1.00	1.22	1.02	1.38	1.59	1.92
3x 8x 3	.44	.51	.50	.53	8x 8x 8	.76	.92	.78	1.06	1.18	1.34
3x 8x 6	.52	.61	.60	.63	8x10x 8	.81	1.02	.83	1.12	1.26	1.48
3x10x 3	.49	.59	.58	.60	8x12x 8	.89	1.12	.91	1.22	1.42	1.60
3x10x 6	.58	.69	.68	.70	8x12x10	We have listed standard sizes.	1.20	1.00	1.30	1.52	1.76
3x12x 3	.56	.67	.66	.68	8x14x 8		1.20	1.00	1.30	1.52	1.76
3x12x 6	.64	.73	.72	.74	8x14x10		1.28	1.08	1.40	1.66	1.88
3x12x 9	.72	.85	.84	.86	8x16x 8		1.28	1.08	1.40	1.66	1.88
3x14x 3	.60	.73	.72	.74	8x16x10		1.36	1.16	1.48	1.74	2.02
3x14x 6	.68	.81	.80	.82	10x10x10		1.12	.96	1.26	1.48	1.70
3x14x 9	.78	.91	.90	.92	10x12x10		1.24	1.04	1.36	1.56	1.82
4x 8x 4	.48	.55	.54	.56	10x14x10		1.32	1.12	1.44	1.68	1.96
4x 8x 6	.53	.63	.62	.64	10x16x10		1.40	1.20	1.52	1.80	2.06
4x10x 4	.53	.63	.62	.64							
4x12x 4	.58	.72	.68	.73							
4x12x 6	.65	.77	.76	.78							
4x14x 4	.65	.77	.76	.78							
4x14x 6	.69	.82	.81	.83							
4x14x 8	.77	.90	.89	.91							
4x16x 4	.72	.88	.84	.87							
4x16x 6	.79	.93	.89	.92							
4x16x 8	.86	.98	.94	.97							

Other sizes on request. Special shapes to order.

WRITE US FOR DISCOUNTS

MILD STEEL BARS.**FLATS—IN STOCK.**

Size.	Length, Feet.	Est. Wt. per ft.	Size.	Length, Feet.	Est. Wt. per ft.
Bdls. 1-4x $\frac{3}{8}$	14	.320	Bdls 3-8x $\frac{7}{8}$	16	1.116
x $\frac{1}{2}$	14	.425	x1	16	1.28
x $\frac{5}{8}$	14	.531	x1 $\frac{1}{8}$	16	1.43
x $\frac{3}{4}$	14	.638	x1 $\frac{1}{4}$	16	1.59
x $\frac{7}{8}$	14	.744	x1 $\frac{3}{8}$	16	1.76
x1	14	.860	Bars x1 $\frac{1}{2}$	16	1.92
x1 $\frac{1}{8}$	14	.957	x1 $\frac{5}{8}$	16	2.08
x1 $\frac{1}{4}$	14 to 16	1.06	x1 $\frac{3}{4}$	16	2.23
x1 $\frac{3}{8}$	14 to 16	1.17	x2	16	2.55
x1 $\frac{1}{2}$	16	1.20	x2 $\frac{1}{8}$	16	2.71
x1 $\frac{3}{4}$	16	1.49	x2 $\frac{1}{4}$	16	2.87
Bars x2	16	1.70	x2 $\frac{1}{2}$	16	3.19
x2 $\frac{1}{4}$	14 to 16	1.91	x2 $\frac{3}{4}$	16	3.51
x2 $\frac{1}{2}$	16	2.12	x3	16	3.83
x2 $\frac{3}{4}$	16	2.34	x3 $\frac{1}{4}$	16	4.15
x3	16	2.55	x3 $\frac{1}{2}$	16	4.47
x3 $\frac{1}{4}$	16	2.76	x4	14 to 16	5.10
x3 $\frac{1}{2}$	16	2.98	x4 $\frac{1}{2}$	16	5.74
x4	16	3.40	x5	16	6.38
x4 $\frac{1}{2}$	16	3.83	x5 $\frac{1}{2}$	14	7.02
x5	16	4.25	x6	16	7.65
x5 $\frac{1}{2}$	16	4.67	Bars		
x6	16	5.10	7-16x1	16	1.49
Bdls.			x1 $\frac{1}{4}$	16	1.86
5-16x $\frac{1}{2}$	14	.531	x1 $\frac{1}{2}$	16	2.23
x $\frac{5}{8}$	14	.664	x1 $\frac{3}{4}$	16	2.60
x $\frac{3}{4}$	14	.797	x2	16	2.98
x $\frac{7}{8}$	14	.929	x2 $\frac{1}{2}$	14	3.72
x1	14 to 16	1.06	x3	14	4.46
x1 $\frac{1}{8}$	16	1.20	x3 $\frac{1}{4}$	14	4.83
x1 $\frac{1}{4}$	16	1.33	x3 $\frac{1}{2}$	16	5.20
x1 $\frac{3}{8}$	16	1.46	x4	16	5.95
Bars x1 $\frac{1}{2}$	16	1.59	x5	16	7.44
x1 $\frac{3}{4}$	16	1.86	1-2x $\frac{3}{4}$	16	1.27
x2	16	2.12	x $\frac{7}{8}$	16	1.48
x2 $\frac{1}{4}$	16	2.39	x1	16	1.70
x2 $\frac{1}{2}$	16	2.65	x1 $\frac{1}{8}$	16	1.92
x2 $\frac{3}{4}$	16	2.92	x1 $\frac{1}{4}$	16	2.12
x3	16	3.19	x1 $\frac{3}{8}$	16	2.34
x3 $\frac{1}{4}$	16	3.45	x1 $\frac{1}{2}$	16	2.55
x3 $\frac{1}{2}$	16	3.72	x1 $\frac{5}{8}$	16	2.72
x4	16	4.25	x1 $\frac{3}{4}$	16	2.98
x4 $\frac{1}{2}$	16	4.78	x2	16	3.40
x5	16	5.31	x2 $\frac{1}{4}$	16	3.83
x5 $\frac{1}{2}$	16	5.84	x2 $\frac{1}{2}$	16	4.25
x6	16	6.38	x2 $\frac{3}{4}$	16	4.67
Bdls 3-8x $\frac{1}{2}$	14	.638	x3	16	5.10
x $\frac{5}{8}$	14	.797	x3 $\frac{1}{4}$	16	5.53
x $\frac{3}{4}$	14	.957	x3 $\frac{1}{2}$	16	5.95

For Steel Classifications, see pages 238 and 239.

For quantity differentials and cutting extras on mill orders, see page 239.

WRITE FOR PRICES.

MILD STEEL BARS—Continued.**FLATS—IN STOCK.**

Size	Length, Feet	Est. Wt. per ft.	Size	Length, Feet	Est. Wt. per ft.
1-2 x4	16	6.80	7-8 x1½	16	4.47
x4½	16	7.65	x1¾	16	5.20
x5	16	8.50	x2	16	5.95
x5½	16	9.35	x2¼	16	6.69
x6	16	10.20	x2½	16	7.44
9-16 x1½	12 to 16	2.87	x3	16	8.93
x1¾	16	3.35	x3½	16	10.41
x2	16	3.83	x4	16	11.90
x2¼	16	4.30	x4½	16	13.39
x2½	16	4.78	x5	16	14.87
x2¾	16	5.26	x5½	16	16.36
x3	16	5.74	x6	16	17.85
5-8 x1	16	2.12	1 x1¼	16	4.25
x1⅛	16	2.39	x1½	16	5.10
x1¼	16	2.65	x1¾	16	5.95
x1⅜	16	2.92	x2	16	6.80
x1½	14 to 16	3.19	x2¼	16	7.65
x1⅝	12	3.46	x2½	16	8.50
x1¾	15	3.72	x2¾	16	9.35
x2	16	4.25	x3	16	10.20
x2¼	16	4.78	x3¼	16	11.05
x2½	16	5.31	x3½	16	11.90
x2¾	16	5.84	x4	16	13.60
x3	16	6.38	x4½	16	15.30
x3¼	16	6.91	x5	16	17.20
x3½	16	7.44	x5½	16	18.70
x4	16	8.50	x6	16	20.40
x4½	16	9.57	1 1-8 x4	16'-8"-18'	15.30
x5	16	10.63	1 1-4 x1½	16	6.38
x5½	16	11.69	x2	16	8.50
x6	16	12.75	x2¼	16	9.56
3-4 x1	14 to 16	2.55	x2½	16	10.63
x1⅛	14 to 16	2.87	x2¾	16	11.69
x1¼	16	3.19	x3	16	12.75
x1½	12 to 14	3.83	x3¼	16	13.81
x1⅝	16	4.15	x3½	16	14.87
x1¾	14 to 16	4.47	x4	16	17.20
x2	14 to 16	5.10	x4½	16	19.13
x2¼	16	5.75	1 1-2 x2	16	10.20
x2½	16	6.38	x2½	16	12.75
x2¾	16	7.02	x3	16	15.30
x3	16	7.65	x4	16	20.40
x3½	16	8.93	x4½	16	22.95
x4	16	10.20	x5	16	25.50
x4½	16	11.48	x5½	16	28.05
x5	16	12.75	x6	16	30.60
x5½	16	14.03	2 x3	16	20.40
x6	16	15.30	x4	16	27.20
7-8 x1	16	2.98	x6	16	40.80
x1¼	16	3.72			

For Steel Classification, see page 238.

For quantity differentials and cutting extras on mill orders, see page 239.

WRITE FOR PRICES.

MILD STEEL BARS.




ROUNDS. IN STOCK.

Diam. in.	L'gth. feet	Est. Wt. per ft.	Diam. in.	L'gth. feet	Est. Wt. per ft.
Bdls.					
3-16	14	.094	2 1/8	16	12.06
1-4	16	.167	2 1/4	16	13.52
5-16	16	.261	2 3/8	16 to 18	15.07
3-8	16	.375	2 1/2	20	16.69
7-16	16	.511	2 5/8	20	18.40
1-2	14 to 16	.667	2 3/4	20	20.20
1-2	30	.667	3	20	24.03
9-16	16	.845	3 1/4	20	28.20
5-8	14 to 16	1.043	3 3/8	20	30.42
3-4	16	1.502	3 1/2	20	32.71
Bars.			3 3/4	20	37.56
7-8	12-14-16	2.044	4	20	42.73
1	16	2.670	4 1/4	20	48.24
1 1/8	16	3.379	4 1/2	20	54.07
1 1/4	16	4.173	4 3/4	20	60.25
1 3/8	16	5.049	5	20	66.76
1 1/2	16	6.008	5 1/4	20	73.60
1 5/8	16	7.051	5 1/2	20	80.77
1 3/4	16	8.178	5 3/4	20	88.29
1 7/8	16	9.388	6	20	96.14
2	16	10.68			




SQUARES. IN STOCK.

Size, inches	L'gth. feet	Est. Wt. per ft.	Size, inches	L'gth. feet	Est. Wt. per ft.
Bdls.					
3-16	11 to 13	.119	1 3/8	16	6.428
1-4	14	.212	1 1/2	16	7.650
5-16	14	.333	1 5/8	16	8.978
3-8	16	.478	1 3/4	16	10.41
7-16	16	.651	1 7/8	16	11.95
1-2	16	.850	2	16	13.60
9-16	14 to 16	1.076	2 1/4	16	17.22
5-8	14 to 16	1.328	2 1/2	16	21.25
3-4	16	1.913	2 5/8	16	23.43
Bars.			2 3/4	18 to 20	25.00
7-8	16	2.603	3	20	30.60
1	16	3.400	3 1/4	19	35.92
1 1/8	16	4.303	3 1/2	18	41.65
1 1/4	16	5.312	4	18	54.40

Sizes not carried in stock furnished promptly from mills.

For Standard Steel Classification see page 236.

Complete table of weights, pages 256 to 258.

For quantity differentials and cutting extras on mill orders, see page 239.

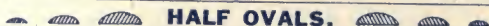
WRITE FOR PRICES.

MILD STEEL BARS. IN STOCK.



OVALS.

Size In.	Length Feet	Est. Wt. per foot	Size In.	Length Feet	Est. Wt. per foot
$\frac{3}{8} \times \frac{3}{16}$	14	.186	$\frac{3}{4} \times \frac{5}{16}$	14	.63
$\frac{3}{8} \times \frac{1}{4}$	14	.210	$\frac{3}{4} \times \frac{3}{8}$	14	.75
$\frac{1}{2} \times \frac{1}{4}$	14	.297	$\frac{3}{4} \times \frac{7}{16}$	14	.86
$\frac{9}{16} \times \frac{5}{16}$	14	.47	$\frac{3}{4} \times \frac{1}{2}$	14	.97
$\frac{9}{16} \times \frac{3}{8}$	14	.51	$\frac{7}{8} \times \frac{1}{2}$	14	1.00
$\frac{5}{8} \times \frac{5}{16}$	14	.51	1 $\times \frac{1}{2}$	14	1.23
$\frac{5}{8} \times \frac{3}{8}$	14	.60	1 $\times \frac{5}{8}$	14	1.77
$\frac{5}{8} \times \frac{7}{16}$	14	.70	$1\frac{1}{4} \times \frac{5}{8}$	14	1.86
$\frac{3}{4} \times \frac{1}{4}$	14	.42			



HALF OVALS.

Size In.	Length Feet	Est. Wt. per foot	Size In.	Length Feet	Est. Wt. per foot
$\frac{3}{8}$, No. 12	14	.093	$1\frac{1}{4} \times \frac{5}{16}$	14	1.00
$\frac{1}{2}$, No. 12	14	.15	$1\frac{1}{2} \times \frac{5}{16}$	14	1.20
$\frac{5}{8}$, No. 12	14	.23	$1\frac{1}{2} \times \frac{3}{8}$	14	1.50
$\frac{3}{4} \times \frac{1}{4}$	14	.50	2 $\times \frac{1}{2}$	14	2.40
$\frac{7}{8} \times \frac{1}{4}$	14	.61	$2\frac{1}{2} \times \frac{1}{2}$	14	3.00
1 $\times \frac{1}{4}$	14	.66	3 $\times \frac{3}{4}$	14	6.00
$1\frac{1}{8} \times \frac{5}{16}$	14	.71			



HALF ROUNDS.

Size In.	Length Feet	Est. Wt. per foot	Size In.	Length Feet	Est. Wt. per foot
$\frac{5}{16}$	12-14	.131	1	14	1.335
$\frac{3}{8}$	14	.187	$1\frac{1}{8}$	14	1.690
$\frac{1}{2}$	14	.334	$1\frac{1}{4}$	14	2.086
$\frac{5}{8}$	14	.522	$1\frac{1}{2}$	14	3.004
$\frac{3}{4}$	14	.751	$1\frac{3}{4}$	14	4.089
$\frac{7}{8}$	14	1.032	2	14	5.34



HEXAGONS.

Size In.	Length Feet	Est. Wt. per foot	Size In.	Length Feet	Est. Wt. per foot
$\frac{9}{16}$	16	.932	$1\frac{1}{4}$	16	4.601
$\frac{5}{8}$	16	1.150	$1\frac{3}{8}$	16	5.567
$\frac{3}{4}$	16	1.656	$1\frac{1}{2}$	16	6.625
$\frac{7}{8}$	16	2.254	$1\frac{5}{8}$	16	7.775
1	16	2.945	$1\frac{3}{4}$	16	9.018
$1\frac{1}{8}$	16	3.727			

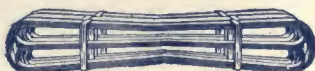
We can furnish from mills high-carbon steel bars, and bar steel to special specifications of all kinds.

Sizes not carried in stock can be shipped promptly from mills.

See Classification on page 237.

For quantity differentials and cutting extras on mill orders see page 239.


WRITE FOR PRICES.

STEEL BANDS.**IN STOCK.****IN SCROLLS.**

Size, in.	Est. Weight per ft.	Size, in.	Est. Weight per ft.	Size, in.	Est. Weight per ft.
3-16x $\frac{3}{8}$	.2391	No.10x $\frac{1}{2}$	.2278	No.12x $\frac{3}{8}$	.1390
x $\frac{1}{2}$	.3000	x $\frac{5}{8}$	.2848	x $\frac{1}{2}$	.1853
x $\frac{5}{8}$	.3825	x $\frac{3}{4}$	.3417	x $\frac{5}{8}$	.2316
x $\frac{3}{4}$	.4590	x $\frac{7}{8}$	.3987	x $\frac{3}{4}$	.2780
x $\frac{7}{8}$	.5355	x1	.4556	x $\frac{7}{8}$	.3243
x1	.6120	x1 $\frac{1}{8}$	.5126	x1	.3706
x1 $\frac{1}{8}$	.6885	x1 $\frac{1}{4}$	.5695	x1 $\frac{1}{8}$	.4169
x1 $\frac{1}{4}$	.7650	x1 $\frac{3}{8}$	.6265	x1 $\frac{1}{4}$	.4633
x1 $\frac{3}{8}$	.8415	x1 $\frac{1}{2}$	.6834	x1 $\frac{3}{8}$	.5096
x1 $\frac{1}{2}$	.9180	x1 $\frac{3}{4}$	.7973	x1 $\frac{1}{2}$	.5559
x1 $\frac{3}{4}$	1.1156	x2	.9112	x1 $\frac{5}{8}$	.6022
x2	1.28	x2 $\frac{1}{4}$	1.0251	x1 $\frac{3}{4}$	.6486
x2 $\frac{1}{4}$	1.44	x2 $\frac{1}{2}$	1.1390	x2	.7412
x2 $\frac{1}{2}$	1.59	x2 $\frac{3}{4}$	1.2529	x2 $\frac{1}{4}$	.8339
x3	1.91	x3	1.3668	x2 $\frac{1}{2}$	.9265
x3 $\frac{1}{2}$	2.23	x3 $\frac{1}{4}$	1.38	x2 $\frac{3}{4}$	1.0192
x4	2.55	x3 $\frac{1}{2}$	1.5946	x3	1.1118
x4 $\frac{1}{2}$	2.87	x4	1.8224	x3 $\frac{1}{4}$	1.2045
x5	3.19	x4 $\frac{1}{2}$	2.0502	x3 $\frac{1}{2}$	1.2971
x5 $\frac{1}{2}$	3.51	x5	2.2780	x4	1.4824
x6	3.83	x5 $\frac{1}{2}$	2.5058		
No.10x $\frac{3}{8}$	.1709	x6	2.7336		

Steel Bands In Cut Lengths.

We also carry in stock $\frac{3}{16}$ " steel bands $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$ and $1\frac{1}{2}$ inches wide in cut lengths of 12 to 16 feet.

 We can have bands and hoops galvanized in Chicago within 24 hours after receipt of order.

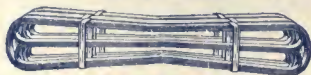
Sizes not carried in stock furnished promptly from mills.

See Classification on page 238.

For quantity differentials and cutting extras on mill orders, see page 239.

WRITE FOR PRICES.

STEEL HOOPS. IN STOCK.



IN SCROLLS.

Size.	Est. weight per ft.	Size.	Est. weight per ft.
No. 14 x $\frac{1}{2}$ in.	.1411	No. 16 x 2 in.	.4420
x $\frac{5}{8}$ in.	.1764	x $2\frac{1}{4}$ in.	.4973
x $\frac{3}{4}$ in.	.2117	x $2\frac{1}{2}$ in.	.5525
x $\frac{7}{8}$ in.	.2469	x $2\frac{3}{4}$ in.	.6078
x 1 in.	.2822	x 3 in.	.6630
x $1\frac{1}{8}$ in.	.3175	No. 18 x $\frac{1}{2}$ in.	.0833
x $1\frac{1}{4}$ in.	.3528	x $\frac{5}{8}$ in.	.1041
x $1\frac{1}{2}$ in.	.4233	x $\frac{3}{4}$ in.	.1250
x $1\frac{3}{4}$ in.	.4939	x $\frac{7}{8}$ in.	.1458
x 2 in.	.5644	x 1 in.	.1666
x $2\frac{1}{4}$ in.	.6350	x $1\frac{1}{8}$ in.	.1874
x $2\frac{1}{2}$ in.	.7055	x $1\frac{1}{4}$ in.	.2083
x $2\frac{3}{4}$ in.	.7761	x $1\frac{1}{2}$ in.	.2499
x 3 in.	.8466	x $1\frac{3}{4}$ in.	.2916
No. 16 x $\frac{1}{2}$ in.	.1105	x 2 in.	.3332
x $\frac{5}{8}$ in.	.1381	x $2\frac{1}{2}$ in.	.4165
x $\frac{3}{4}$ in.	.1658	x 3 in.	.4998
x $\frac{7}{8}$ in.	.1934	No. 19 x $\frac{7}{8}$ in.	12.49
x 1 in.	.2210	x 1 in.	.1428
x $1\frac{1}{8}$ in.	.2486	x $1\frac{1}{8}$ in.	.1607
x $1\frac{1}{4}$ in.	.2763	x $1\frac{1}{4}$ in.	.1785
x $1\frac{1}{2}$ in.	.3315	x $1\frac{1}{2}$ in.	.2142
x $1\frac{3}{4}$ in.	.3868	x $1\frac{3}{4}$ in.	.2499



IN COILS.

Size.	Est. weight per ft.	Size.	Est. weight per ft.
No. 19 x $\frac{7}{8}$ in.	.1250	No. 20 x $1\frac{1}{8}$ in.	.1339
x 1 in.	.1428	x $1\frac{1}{4}$ in.	.1488
x $1\frac{1}{8}$ in.	.1607	No. 22 x $\frac{1}{2}$ in.	.0476
x $1\frac{1}{4}$ in.	.1785	x $\frac{5}{8}$ in.	.0595
x $1\frac{1}{2}$ in.	.2142	x $\frac{3}{4}$ in.	.0714
x $1\frac{3}{4}$ in.	.2499	x $\frac{7}{8}$ in.	.0833
No. 20 x $\frac{1}{2}$ in.	.0595	x 1 in.	.0952
x $\frac{5}{8}$ in.	.0744	x $1\frac{1}{8}$ in.	.1071
x $\frac{3}{4}$ in.	.0893	x $1\frac{1}{4}$ in.	.1190
x $\frac{7}{8}$ in.	.1041	x $1\frac{3}{4}$ in.	1.666
x 1 in.	.1190	No. 23 x $\frac{1}{2}$ in.	.0425

Sizes not carried in stock furnished promptly from mill.

See Classification, quantity differentials and cutting extras for mill orders on page 240.

WRITE FOR PRICES.

ROUND EDGE STEEL TIRE.

IN STOCK.

Size, Inches	Length	Size, Inches	Length	Size, Inches	Length
$\frac{1}{8}x\frac{3}{4}$	12' 6" and 13' 6"	$\frac{1}{8}x3$	12' and 15'	$\frac{3}{4}x2$	10' 6" and 14' 4"
$\frac{1}{8}x\frac{7}{8}$	12' 6" and 13' 6"	$\frac{1}{8}x3$	10'	$\frac{3}{4}x2\frac{1}{4}$	10' 6" and 14' 4"
$\frac{1}{8}x1$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{1}{4}$	12' and 15'	$\frac{3}{4}x2\frac{1}{4}$	12' and 15'
$\frac{1}{8}x1\frac{1}{8}$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{3}{8}$	12' and 15'	$\frac{3}{4}x2\frac{1}{2}$	12' and 15'
$\frac{1}{4}x\frac{3}{4}$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{1}{2}$	10' 6" and 14' 4"	$\frac{3}{4}x2\frac{3}{4}$	12' and 15'
$\frac{1}{4}x\frac{7}{8}$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{1}{2}$	12' and 15'	$\frac{3}{4}x3$	10' 6" and 14' 4"
$\frac{1}{4}x1$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{5}{8}$	12' and 15'	$\frac{3}{4}x3\frac{1}{2}$	10' 6"
$\frac{1}{4}x1\frac{1}{8}$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{3}{4}$	12' and 15'	$\frac{3}{4}x3\frac{1}{2}$	12' and 15'
$\frac{1}{4}x1\frac{1}{4}$	12' 6" and 13' 6"	$\frac{1}{8}x2$	10' 6" and 14' 4"	$\frac{3}{4}x4$	9' 6" and 12'
$\frac{1}{8}x\frac{7}{8}$	12' 6" and 13' 6"	$\frac{1}{8}x2$	12' and 15'	$\frac{3}{4}x4$	10' 6" and 15' 6"
$\frac{1}{8}x1$	12' 6" and 13' 6"	$\frac{1}{8}x2\frac{1}{4}$	12' and 15'	$\frac{3}{4}x4$	12' 6" and 15'
$\frac{1}{8}x1\frac{1}{8}$	12' 6" and 13' 6"	$\frac{1}{8}x2\frac{1}{2}$	12' and 15'	$\frac{1}{2}x2$	12' and 15'
$\frac{1}{8}x1\frac{1}{4}$	12' 6" and 13' 6"	$\frac{1}{8}x2\frac{1}{2}$	10'	$\frac{1}{2}x2\frac{1}{2}$	12' and 15'
$\frac{1}{8}x1\frac{1}{2}$	12' 6" and 13' 6"	$\frac{1}{8}x2\frac{3}{4}$	10' 12' and 15'	$\frac{1}{2}x2\frac{1}{2}$	12' and 15'
$\frac{1}{8}x3$	12' and 15'	$\frac{1}{8}x3$	10'	$\frac{1}{2}x2\frac{1}{2}$	10' 6"
$\frac{1}{8}x3$	10'	$\frac{1}{8}x3$	12' and 15'	$\frac{1}{2}x2\frac{3}{4}$	10' 6"
$\frac{1}{8}x3\frac{1}{2}$	10'	$\frac{1}{8}x3\frac{1}{2}$	12' and 15'	$\frac{1}{2}x3$	12' and 15'
$\frac{1}{8}x3\frac{1}{2}$	12' and 15'	$\frac{1}{8}x3\frac{1}{2}$	10'	$\frac{1}{2}x3$	12' and 15'
$\frac{1}{8}x4$	12' and 15'	$\frac{1}{8}x4$	10'	$\frac{1}{2}x3\frac{1}{2}$	10' 6"
$\frac{1}{8}x4$	10'	$\frac{1}{8}x4$	12' and 15'	$\frac{1}{2}x3\frac{1}{2}$	12' and 15'
$\frac{3}{8}x1\frac{1}{8}$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{1}{2}$	10' 6" and 14' 4"	$\frac{1}{2}x3\frac{1}{2}$	12' and 15'
$\frac{3}{8}x1\frac{1}{4}$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{1}{2}$	12' and 15'	$\frac{1}{2}x4$	12' and 15'
$\frac{3}{8}x1\frac{3}{8}$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{5}{8}$	12' and 15'	$\frac{1}{2}x4$	12' and 15'
$\frac{3}{8}x1\frac{1}{2}$	12' 6" and 13' 6"	$\frac{1}{8}x1\frac{5}{8}$	10' 6" and 14' 4"	$\frac{1}{2}x4$	12' and 15'
$\frac{3}{8}x1\frac{1}{2}$	12' and 15'	$\frac{1}{8}x1\frac{3}{4}$	10' 6" and 14' 4"	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x1\frac{3}{4}$	12' and 15'	$\frac{1}{8}x1\frac{3}{4}$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x2$	12' and 15'	$\frac{1}{8}x2$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x2\frac{1}{4}$	12' and 15'	$\frac{1}{8}x2$	10' 6" and 14' 4"	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x2\frac{1}{2}$	12' and 15'	$\frac{3}{8}x1\frac{3}{4}$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x2\frac{1}{2}$	10'	$\frac{3}{8}x1\frac{3}{4}$	10' 6" and 14' 4"	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x3$	10'	$\frac{3}{8}x2$	10' 6" and 14' 4"	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x3$	12' and 15'	$\frac{3}{8}x2$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x3\frac{1}{2}$	12' and 15'	$\frac{3}{8}x2\frac{1}{4}$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x3\frac{1}{2}$	10'	$\frac{3}{8}x2\frac{1}{4}$	10' 6" and 14' 4"	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x4$	10'	$\frac{3}{8}x2\frac{3}{4}$	10' 6" and 12'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{3}{8}x4$	12' and 15'	$\frac{3}{8}x3$	10' 6"	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{1}{8}x1\frac{1}{4}$	12' 6" and 13' 6"	$\frac{3}{8}x3$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{1}{8}x1\frac{3}{8}$	12' 6" and 13' 6"	$\frac{3}{8}x3\frac{1}{2}$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{1}{8}x1\frac{1}{2}$	12' and 15'	$\frac{3}{8}x3\frac{1}{2}$	10' 6"	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{1}{8}x2$	12' and 15'	$\frac{3}{8}x4$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{1}{8}x2\frac{1}{2}$	12' and 15'	$\frac{3}{8}x5$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"
$\frac{1}{8}x2\frac{1}{2}$	10'	$\frac{3}{4}x2$	12' and 15'	$\frac{1}{2}x4$	10' 6" and 15' 6"

Above can be furnished in sets in lengths shown.

For weights of Steel Tires add about 10 per cent to weights of steel bars, as shown on page 257. Estimated weights in sets, page 258.

Special sizes and lengths shipped promptly from mills.

For Steel Tire classification, see page 239.

WRITE FOR PRICES.


BEVEL EDGE MILD STEEL.

IN STOCK.

Size, in.	Length, ft.	Est. Wt. per ft.	Size, in.	Length, ft.	Est. Wt. per ft.
No. 12 x $\frac{3}{4}$	Scrolls	.233	5-16 x 1	14	.93
x $\frac{7}{8}$	"	.308	x $1\frac{1}{8}$	14	1.05
3-16 x $\frac{3}{4}$	14	.43	x $1\frac{1}{4}$	14	1.16
x $\frac{7}{8}$	14	.49	x $1\frac{3}{8}$	14	1.27
x 1	14	.55	x $1\frac{1}{2}$	14	1.42
1-4 x $\frac{3}{4}$	14	.55	3-8 x $1\frac{1}{4}$	14	1.41
x $\frac{7}{8}$	14	.65	x $1\frac{3}{8}$	14	1.54
x 1	14	.75	x $1\frac{1}{2}$	14	1.68
x $1\frac{1}{8}$	14	.83	x $1\frac{3}{4}$	14	1.95
x $1\frac{1}{4}$	14	.93	x $1\frac{7}{8}$	14	2.09
5-16 x $\frac{7}{8}$	14	.82			

Takes Standard Steel Classification, page 238.


SEWER RODS
FOR PLUMBERS-IN STOCK
**IN COILS 75 TO 100 FEET IN LENGTH.**

Size, in.	Est. Weight per Foot.	Size, in.	Est. Weight per Foot.
$\frac{1}{8}$ x $1\frac{1}{4}$	.531	$\frac{1}{8}$ x $1\frac{1}{2}$	.638

STONE AND MARBLE SAW BLADES.

Carefully cut to length and straightened.

IN STOCK.

Size, in.	Length.	Est. Weight per Foot.	Extra per Cwt. Over Same Size Bands.
$\frac{1}{8}$ x 4	15 ft. 1 in.	1.70	\$0.15
$\frac{1}{8}$ x 4	15 ft. 8 in.	1.70	0.15

Other sizes and lengths furnished promptly from mills.
 See classification, page 239.

PACKING HOUSE BEEF RAIL.
IN STOCK.


Size. (Measurement over all)	Length.	Est. Weight per Foot.
$\frac{1}{2}$ x $2\frac{1}{2}$ round edge	16 ft.	3.95

WRITE FOR PRICES.

SMOOTH FINISH, OPEN HEARTH MACHINERY STEEL.

IN STOCK.

Size.	Length.	Est. Wt. per ft.	Size.	Length.	Est. Wt. per ft.
Round.			Round.		
$\frac{1}{4}$ in.	16 ft.	.166	$1\frac{5}{8}$ in.	16 ft.	7.051
$\frac{5}{16}$ in.	16 ft.	.260	$1\frac{3}{4}$ in.	16 ft.	8.178
$\frac{3}{8}$ in.	16 ft.	.375	$1\frac{7}{8}$ in.	16 ft.	9.388
$\frac{7}{16}$ in.	16 ft.	.511	2 in.	16 ft.	10.68
$\frac{1}{2}$ in.	16 ft.	.667	$2\frac{1}{8}$ in.	16 ft.	12.06
$\frac{9}{16}$ in.	16 ft.	.844	$2\frac{1}{4}$ in.	16 ft.	13.52
$\frac{5}{8}$ in.	16 ft.	1.043	$2\frac{3}{8}$ in.	16 ft.	15.07
$\frac{11}{16}$ in.	16 ft.	1.262	$2\frac{1}{2}$ in.	16 ft.	16.69
$\frac{3}{4}$ in.	16 ft.	1.502	$2\frac{5}{8}$ in.	16 ft.	18.40
$\frac{7}{8}$ in.	16 ft.	2.044	$2\frac{3}{4}$ in.	16 ft.	20.20
1 in.	16 ft.	2.670	3 in.	16 ft.	24.03
$1\frac{1}{8}$ in.	16 ft.	3.379			
$1\frac{1}{4}$ in.	16 ft.	4.173	Square.		
$1\frac{3}{8}$ in.	16 ft.	5.019	$\frac{5}{16}$ in.	16 ft.	.3333
$1\frac{1}{2}$ in.	16 ft.	6.008	$\frac{3}{8}$ in.	16 ft.	.4782

Smooth finish machinery steel is rolled accurately, within 1-64 inch.
Takes Standard Steel Classification and quantity differentials on mill
orders—See page 236.

Can furnish, from mill, squares and flats.

BONE CRUSHER STEEL.

IN STOCK.

Size.	Length.	Est. Weight per ft.
Round.		
$1\frac{3}{4}$ in.	16 ft.	8.18

CURVED SLEIGH SHOE STEEL.

IN STOCK.

Size.	Length.	Est. Weight per ft.
$\frac{3}{8} \times 1\frac{3}{4}$ in.	16 ft.	2.23
x 2 in.	16 ft.	2.55
x $2\frac{1}{2}$ in.	16 ft.	3.19
x 3 in.	16 ft.	3.83
x $3\frac{1}{2}$ in.	16 ft.	4.47

Can furnish other sizes from mill.

WRITE FOR PRICES.

OPEN HEARTH SPRING STEEL. IN STOCK.

Size, Inches	Length, Feet	Est. Weight per Foot	Size, Inches	Length, Feet	Est. Weight per Foot
1-8 x $\frac{5}{8}$	14	.2650	1-4 x $1\frac{5}{8}$	14	1.38
x $\frac{3}{4}$	14	.3188	x $1\frac{3}{4}$	14	1.49
x $\frac{7}{8}$	14	.3720	x 2	14	1.70
x 1	14	.4250	x $2\frac{1}{4}$	14	1.92
x $1\frac{1}{8}$	14	.4782	x $2\frac{1}{2}$	14	2.12
x $1\frac{1}{4}$	14	.5312	x $2\frac{3}{4}$	14	2.34
x $1\frac{1}{2}$	14	.638	x 3	14	2.55
x $1\frac{3}{4}$	14	.744			
x 2	14	.850	5-16 x $1\frac{1}{2}$	14	1.59
3-16 x 1	14	.638	x $1\frac{3}{4}$	14	1.86
x $1\frac{1}{8}$	14	.717	x 2	14	2.12
x $1\frac{1}{4}$	14	.797	x $2\frac{1}{4}$	14	2.39
x $1\frac{1}{2}$	14	.957	x $2\frac{1}{2}$	14	2.65
x $1\frac{3}{4}$	14	1.15	x $2\frac{3}{4}$	14	2.92
x 2	14	1.28	x 3	14	3.19
1-4 x 1	14	.850	3-8 x 2	14	2.55
x $1\frac{1}{8}$	14	.957	x $2\frac{1}{4}$	14	2.87
x $1\frac{1}{4}$	14	1.06	x $2\frac{1}{2}$	14	3.19
x $1\frac{3}{8}$	14	1.17	x $2\frac{3}{4}$	14	3.51
x $1\frac{1}{2}$	13	1.28	x 3	14	3.83

CRUCIBLE SPRING STEEL. IN STOCK.

Size, Inches	Length, Feet	Est. Weight per Foot	Size, Inches	Length, Feet	Est. Weight per Foot
No. 14 x $\frac{1}{2}$	14	.1411	No. 16 x $\frac{5}{8}$	14	.1381
x $\frac{5}{8}$	14	.1764	1-4 x $1\frac{1}{2}$	14	1.28
x $\frac{3}{4}$	14	.2117			

Other sizes furnished promptly from mill.

For Classification see page 241.

WRITE FOR PRICES.

COLD DRAWN AND TURNED STEEL SHAFTING.

The most accurate shafting made.



IN STOCK.

Diam. in Inches	L'ngths We Carry	Weight per ft. in lbs.	LIST PRICE per lb.	Diam. in Inches	L'ngths We Carry	Weight per ft. in lbs.	LIST PRICE per lb.
6	Stock lengths 12 to 24 feet. Will cut to any length from 1 to 24 feet without extra charge.	96.14	8 cts	2 ⁵ / ₈	Stock lengths 12 to 24 feet. Will cut to any length from 1 to 24 feet without extra charge.	14.35	5 cts
5 ¹ / ₂		94.14	7 ¹ / ₂ cts	2 ¹ / ₂		13.52	
5 ¹ / ₂		80.77		2 ³ / ₈		12.80	
5 ⁷ / ₈		78.95	7 cts	2 ¹ / ₂		12.07	
5		67.45		2 ¹ / ₂		11.35	
4 ¹ / ₂		65.50	6 ¹ / ₂ cts	2		10.69	
4 ¹ / ₂		60.88		1 ⁵ / ₈		10.03	
4 ¹ / ₂		58.66		1 ⁵ / ₈		9.39	
4 ¹ / ₂		54.11		1 ³ / ₂		8.78	
4 ⁷ / ₈		52.62	6 cts	1 ³ / ₂		8.18	
4 ³ / ₈		51.80		1 ³ / ₂		7.61	
4 ¹ / ₂		48.26		1 ³ / ₂		7.06	
4 ³ / ₈		47.40		1 ³ / ₂		6.52	
4		42.75	5 ¹ / ₂ cts	1 ³ / ₂		6.01	
3 ⁵ / ₈		41.25		1 ⁷ / ₈		5.52	5 ¹ / ₂ cts
3 ⁵ / ₈		39.95		1 ³ / ₂		5.26	
3 ⁵ / ₈		37.57		1 ³ / ₂		5.05	
3 ⁵ / ₈		36.40		1 ⁷ / ₈		4.61	
3 ⁵ / ₈		35.20		1 ⁷ / ₈		4.17	
3 ⁵ / ₈		34.00	5 ¹ / ₂ cts	1 ³ / ₂		3.77	
3 ⁵ / ₈		32.73		1 ³ / ₂		3.38	
3 ⁷ / ₈		31.58		1 ⁷ / ₈		3.02	
3 ³ / ₈		30.43		1		2.68	
3 ³ / ₈		28.22	5 ¹ / ₂ cts	15-16		2.35	
3 ³ / ₈		27.16		7-8		2.05	
3 ³ / ₈		26.09		13-16		1.77	
3 ³ / ₈				3-4		1.50	
3		24.05	5 cts	11-16		1.25	6 cts
2 ⁵ / ₈		23.06		5-8		1.05	
2 ⁵ / ₈		22.09		9-16		.845	
2 ⁵ / ₈		21.15		1-2		.667	7 cts
2 ⁵ / ₈		20.21		7-16		.511	
2 ⁵ / ₈		19.31		3-8		.375	
2 ⁵ / ₈		18.41		5-16		.260	8 ¹ / ₂ cts
2 ⁵ / ₈		17.55		1-4		.167	
2 ⁵ / ₈		16.70		3-16		.095	
2 ⁵ / ₈		15.89					10 cts
2 ⁵ / ₈		15.07					

Above prices are for shafts from 5 feet to 24 feet long inclusive.
An extra charge will be made for boxing when necessary.
Milled Key-Seats at reasonable rates.

EXTRAS FOR SHORT AND LONG LENGTHS.

For Shafts 24 in. to 59¹/₂ in. long, 10c per 100 lbs. net extra.

12 in. to 23¹/₂ in. long, 25c per 100 lbs. net extra.

6 in. to 11¹/₂ in. long, $\frac{1}{2}$ cent per lb. net extra.

3 in. to 5¹/₂ in. long, 1 cent per lb. net extra.

shorter than 3 in., special prices will be quoted.

For Shafts over 24 ft. long and less than 30 ft., $\frac{1}{2}$ cent per lb. net extra.

For Shafts 30

35

1

" " 35

40

1¹/₂

" " 40

45

2

" " 45

50

2¹/₂

Pump and Piston Rods, $\frac{1}{2}$ cent per lb. net extra.

WRITE FOR DISCOUNTS.

COLD ROLLED SQUARES.

For Keys, Splines, Square Shafts, etc.
IN STOCK.

Size in Inches.	Lengths We Carry.	Est. Wt. per foot in lbs.	LIST PRICE per lb.	Size in Inches.	Lengths We Carry.	Est. Wt. per foot in lbs.	LIST PRICE per lb.
4	For lengths see Note below	54.42	11 cts	1	For lengths see Note below	3.40	8 cts
3	For lengths see Note below	47.84	10	15-16	For lengths see Note below	2.99	10 cts
3	For lengths see Note below	41.67		7-8	For lengths see Note below	2.60	
3	For lengths see Note below	35.93		13-16	For lengths see Note below	2.25	
3	For lengths see Note below	30.61		3-4	For lengths see Note below	1.92	
3	For lengths see Note below	25.72		11-16	For lengths see Note below	1.61	
3	For lengths see Note below	21.26		5-8	For lengths see Note below	1.34	
3	For lengths see Note below	17.25		9-16	For lengths see Note below	1.08	
3	For lengths see Note below	13.60	8	1-2	For lengths see Note below	.850	
3	For lengths see Note below	10.41		7-16	For lengths see Note below	.652	
3	For lengths see Note below	8.98		3-8	For lengths see Note below	.479	
3	For lengths see Note below	7.66		5-16	For lengths see Note below	.332	12 cts
3	For lengths see Note below	6.43		1-4	For lengths see Note below	.213	
3	For lengths see Note below	5.31					
3	For lengths see Note below	4.30					
3	For lengths see Note below	3.85					

Above prices are for Squares from 5 feet to 24 feet long inclusive.

We can cut above to any length desired.

EXTRA FOR SHORT LENGTHS.

For Shafts 24 in. to 59 $\frac{1}{8}$ in., $\frac{1}{4}$ cent per lb. net extra.

For Shafts 12 in. to 23 $\frac{1}{8}$ in. long, $\frac{1}{4}$ cent per lb. net extra.

For Shafts 6 in. to 11 $\frac{1}{8}$ in. long, $\frac{1}{2}$ cent per lb. net extra.

For Shafts 3 in. to 5 $\frac{1}{8}$ in. long, 1 cent per lb. net extra.

For Shafts shorter than 3 in. or longer than 24 ft., special prices will be quoted.

COLD ROLLED HEXAGONS.

Size.	Est. Wt. per foot in lbs.	LIST PRICE per lb.	Size.	Est. Wt. per foot in lbs.	LIST PRICE per lb.
1 $\frac{1}{2}$	10.32		13-16	1.91	
1 $\frac{3}{8}$	9.00		3-4	1.66	
1 $\frac{1}{4}$	8.37		11-16	1.40	7 $\frac{1}{2}$ cts.
1 $\frac{3}{16}$	7.76		5-8	1.15	
1 $\frac{1}{8}$	7.17		9-16	.98	
1 $\frac{1}{16}$	6.62		1-2	.73	
1 $\frac{1}{32}$	6.07		7-16	.56	8 cts.
1 $\frac{1}{64}$	5.57	7 cts	3-8	.43	
1 $\frac{1}{128}$	5.07		5-16	.29	
1 $\frac{1}{256}$	4.60		9-16	.23	10 cts.
1 $\frac{1}{512}$	4.15		1-4	.195	
1 $\frac{1}{1024}$	3.78				
1 $\frac{1}{2048}$	3.33				
1 $\frac{1}{4096}$	2.94				
15-16	2.58				
7-8	2.25				

The above prices are for Hexagons from 5 feet to 24 feet long inclusive.

EXTRAS FOR SHORT AND LONG LENGTHS.

For Shafts 24 in. to 59 $\frac{1}{8}$ in., 10c per 100 lbs. net extra.

For Shafts 12 in. to 23 $\frac{1}{8}$ in. long, $\frac{1}{4}$ cent per lb. net extra.

For Shafts 6 in. to 11 $\frac{1}{8}$ in. long, $\frac{1}{2}$ cent per lb. net extra.

For Shafts 3 in. to 5 $\frac{1}{8}$ in. long, 1 cent per lb. net extra.

For Shafts shorter than 3 in. or longer than 24 ft., special prices will be quoted.

COLD ROLLED FLATS.—IN STOCK.

WIDTHS, INCHES.

Thickness, Inches.	$\frac{1}{16}$ to $\frac{1}{8}$	$\frac{9}{16}$ to $\frac{1}{2}$	$\frac{3}{4}$ to 1	1 $\frac{1}{16}$ to 1 $\frac{1}{8}$	1 $\frac{9}{16}$ to 1 $\frac{1}{2}$	1 $\frac{11}{16}$ to 2	2 $\frac{1}{16}$ to 2 $\frac{1}{4}$	2 $\frac{5}{16}$ to 2 $\frac{1}{2}$	2 $\frac{7}{16}$ to 2 $\frac{3}{4}$	2 $\frac{9}{16}$ to 3
$\frac{1}{8}$ and $\frac{5}{16}$	16	16	12	12	10	10	10	10	10	10
$\frac{3}{16}$ to $\frac{1}{4}$	14	14	10	10	8	8	8	8	8	8
$\frac{7}{16}$ and $\frac{1}{2}$	14	14	10	10	8	8	8	8	8	8
$\frac{9}{16}$ and $\frac{5}{8}$	.....	10	8	8	8	8	8	8	8	8
$\frac{11}{16}$ and $\frac{3}{4}$	.....	10	8	8	8	8	8	8	8	8
$\frac{13}{16}$ to 1	.....	.....	8	8	8	8	8	8	8	8
1 to 1 $\frac{1}{16}$	.....	.....	.....	8	8	8	8	8	8	8
1 $\frac{1}{8}$ to 1 $\frac{1}{4}$	.....	.....	.....	.....	8	8	8	8	8	8
1 $\frac{1}{4}$ to 1 $\frac{1}{2}$	.....	.....	.....	.....	.....	8	8	8	8	8
2 to 2 $\frac{1}{16}$	.....	.....	.....	.....	.....	.....	8	8	8	8
2 $\frac{1}{8}$ to 2 $\frac{1}{4}$	.....	.....	.....	.....	.....	.....	.....	8	8	8
2 $\frac{1}{4}$ to 2 $\frac{1}{2}$	.....	.....	.....	.....	.....	.....	.....	.....	8	8
2 $\frac{1}{2}$ to 2 $\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	.....	.....	8

The above prices are for flats not over 24 ft. long and not less than 5 ft. long.

EXTRA FOR SHORT LENGTHS.

For Flats 24 in. to 59 $\frac{1}{8}$ in., $\frac{1}{4}$ cent per lb. net extra.

" " 12 " 23 $\frac{1}{8}$ " " " "

" " 6 " 11 $\frac{1}{8}$ " " " "

" " 3 " 5 $\frac{1}{8}$ " " " "

shorter than 3 in. or longer than 24 ft. special prices will be quoted.

WRITE FOR DISCOUNTS.

SCULLY TOOL STEEL.**STRONG AND TENACIOUS.**

Suitable for Mining Drills, Quarry Tools, Axes, Hammers, Sledges, Hand Chisels, and generally when a hard surface, combined with tenacity, is required. Forging done at light red and hardening at cherry red. Welding is easily done with borax and sand.

SIZES CARRIED IN STOCK AT CHICAGO

Octagons	Rounds	Square	Flat	Flat	Flat
$\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{2}$	3-8 $\times 1\frac{1}{4}$	5-8 $\times 3$	7-8 $\times 5\frac{1}{2}$
$\frac{5}{16}$	2	$2\frac{3}{4}$	$\times 1\frac{3}{8}$	$\times 3\frac{1}{2}$	$\times 6$
$\frac{3}{8}$	$2\frac{1}{4}$	3	$\times 1\frac{1}{2}$	$\times 4$	$1 \times 1\frac{1}{4}$
$\frac{7}{16}$	$2\frac{5}{16}$	$3\frac{1}{2}$	$\times 1\frac{3}{4}$	$\times 4\frac{1}{2}$	$\times 1\frac{1}{2}$
$\frac{1}{2}$	$2\frac{1}{2}$	4	$\times 2$	$\times 5$	$\times 1\frac{3}{4}$
$\frac{9}{16}$	$2\frac{3}{4}$	$4\frac{1}{2}$	$\times 2\frac{1}{2}$	$\times 5\frac{1}{2}$	$\times 2$
$\frac{5}{8}$	3	5	$\times 3$	$\times 6$	$\times 2\frac{1}{4}$
$\frac{3}{4}$	$3\frac{1}{2}$	6	$\times 4$	3-4 $\times 1$	$\times 2\frac{1}{2}$
$\frac{7}{8}$	4	Flat	$\times 5$	$\times 1\frac{1}{4}$	$\times 2\frac{3}{4}$
$\frac{15}{16}$	$4\frac{1}{4}$	1-4 $\times \frac{1}{2}$	$\times 6$	$\times 1\frac{1}{2}$	$\times 3$
1	$4\frac{1}{2}$	$\times \frac{3}{4}$	1-2 $\times \frac{3}{4}$	$\times 1\frac{3}{4}$	$\times 3\frac{1}{4}$
$1\frac{1}{8}$	$4\frac{3}{4}$	$\times 1$	$\times 1$	$\times 2$	$\times 3\frac{1}{2}$
$1\frac{1}{4}$	5	$\times 1\frac{1}{8}$	$\times 1\frac{1}{8}$	$\times 2\frac{1}{2}$	$\times 4$
$1\frac{3}{8}$	$5\frac{1}{4}$	$\times 1\frac{1}{4}$	$\times 1\frac{1}{4}$	$\times 3$	$\times 5$
$1\frac{1}{2}$	$5\frac{1}{2}$	$\times 1\frac{3}{8}$	$\times 1\frac{3}{8}$	$\times 3\frac{1}{2}$	$\times 6$
$1\frac{3}{4}$	6	$\times 1\frac{1}{2}$	$\times 1\frac{1}{2}$	$\times 4$	1 1-4 $\times 2\frac{1}{2}$
2	Square	$\times 1\frac{3}{4}$	$\times 1\frac{5}{8}$	$\times 4\frac{1}{2}$	$\times 3$
Rounds	$\frac{1}{4}$	$\times 2$	$\times 1\frac{3}{4}$	$\times 5$	$\times 3\frac{1}{2}$
$\frac{1}{4}$	$\frac{3}{8}$	$\times 2\frac{1}{4}$	$\times 2$	$\times 5\frac{1}{2}$	$\times 4$
$\frac{5}{16}$	$\frac{7}{16}$	$\times 2\frac{1}{2}$	$\times 2\frac{1}{2}$	$\times 6$	$\times 4\frac{1}{2}$
$\frac{3}{8}$	$\frac{1}{2}$	$\times 3$	$\times 3$	7-8 $\times 1$	$\times 5$
$\frac{7}{16}$	$\frac{5}{8}$	5-16 $\times \frac{5}{8}$	$\times 3\frac{1}{2}$	$\times 1\frac{1}{4}$	$\times 6$
$\frac{1}{2}$	$\frac{3}{4}$	$\times \frac{3}{4}$	$\times 4$	$\times 1\frac{3}{8}$	1 1-2 $\times 3$
$\frac{5}{8}$	$\frac{7}{8}$	$\times \frac{7}{8}$	$\times 4\frac{1}{2}$	$\times 1\frac{1}{2}$	$\times 3\frac{1}{2}$
$\frac{3}{4}$	1	$\times 1$	$\times 5$	$\times 1\frac{3}{4}$	$\times 4$
$\frac{13}{16}$	$1\frac{1}{8}$	$\times 1\frac{1}{4}$	$\times 5\frac{1}{2}$	$\times 2$	$\times 4\frac{1}{2}$
$\frac{15}{16}$	$1\frac{1}{4}$	$\times 1\frac{3}{8}$	$\times 6$	$\times 2\frac{1}{4}$	$\times 5$
$\frac{7}{8}$	$1\frac{3}{8}$	$\times 1\frac{1}{2}$	5-8 $\times 1$	$\times 2\frac{1}{2}$	$\times 6$
$\frac{15}{16}$	$1\frac{1}{2}$	$\times 1\frac{3}{4}$	$\times 1\frac{1}{4}$	$\times 2\frac{3}{4}$	2 $\times 3$
1	$1\frac{5}{8}$	$\times 2$	$\times 1\frac{1}{2}$	$\times 3$	$\times 4$
$1\frac{1}{8}$	$1\frac{3}{4}$	$\times 2\frac{1}{2}$	$\times 1\frac{3}{4}$	$\times 3\frac{1}{2}$	$\times 5$
$1\frac{1}{4}$	$1\frac{7}{8}$	$\times 3$	$\times 2$	$\times 4$	$\times 6$
$1\frac{3}{8}$	2	3-8 $\times \frac{3}{4}$	$\times 2\frac{1}{4}$	$\times 4\frac{1}{2}$	
$1\frac{1}{2}$	$2\frac{1}{4}$	$\times 1$	$\times 2\frac{1}{2}$	$\times 5$	

See Classification, page 242.

WRITE FOR BOOKLET AND PRICES.

SCULLY "EXTRA" TOOL STEEL.**TOUGH AND HARD.**

For High Grade Chisels, Stamps, Drills, and for Blacksmith Purposes and Tools generally.

Oct.	Round	Square	Flat	Flat	Flat
$\frac{1}{4}$	$\frac{7}{16}$	$\frac{7}{16}$	5-16x $\frac{13}{8}$	1-2x $\frac{13}{8}$	3-4x2
$\frac{5}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	x $\frac{1}{2}$	x $\frac{1}{2}$	x $2\frac{1}{2}$
$\frac{3}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	x $\frac{13}{4}$	x $\frac{13}{4}$	x3
$\frac{7}{16}$	$\frac{3}{4}$	$\frac{3}{4}$	x2	x2	x4
$\frac{1}{2}$	$\frac{7}{8}$	$\frac{7}{8}$	x $2\frac{1}{2}$	x $2\frac{1}{2}$	7-8x1
$\frac{9}{16}$	1	1	x3	x3	x $1\frac{1}{4}$
$\frac{5}{8}$	$1\frac{1}{4}$	$1\frac{1}{4}$	3-8x $\frac{5}{8}$	5-8x1	x $\frac{13}{8}$
$\frac{3}{4}$	$\frac{13}{8}$	$\frac{13}{8}$	x $\frac{3}{4}$	x $\frac{1}{4}$	x $1\frac{1}{2}$
$\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	x1	x $1\frac{1}{2}$	x2
1	$1\frac{3}{4}$	$1\frac{3}{4}$	x $1\frac{1}{4}$	x $1\frac{3}{4}$	x3
$1\frac{1}{8}$	2	2	x $1\frac{3}{8}$	x2	x4
$1\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{4}$	x $1\frac{1}{2}$	x $2\frac{1}{2}$	1x $1\frac{1}{4}$
$1\frac{3}{8}$	$2\frac{3}{4}$	$2\frac{1}{2}$	x $1\frac{3}{4}$	x3	x $1\frac{1}{2}$
$1\frac{1}{2}$	3	3	x2	3-4x $\frac{7}{8}$	x2
$1\frac{3}{4}$	4	$3\frac{1}{2}$	x $2\frac{1}{2}$	x1	x $2\frac{1}{2}$
2		4	x3	x $1\frac{1}{4}$	x3
Round	Square	Flat	1-2x $\frac{3}{4}$	x $1\frac{1}{2}$	x4
$\frac{1}{4}$	$\frac{1}{4}$	5-16x1	x1	x $\frac{13}{4}$	x5
$\frac{5}{16}$	$\frac{5}{16}$	x $1\frac{1}{4}$	x $1\frac{1}{4}$		
$\frac{3}{8}$	$\frac{3}{8}$				

SCULLY "EXTRA" ANNEALED.

Round	Square	Flat	Flat	Flat	Flat
$\frac{1}{4}$	$\frac{1}{4}$	1-4x $\frac{5}{8}$	5-16x $2\frac{1}{2}$	1-2x $\frac{13}{4}$	3-4x $2\frac{1}{2}$
$\frac{5}{16}$	$\frac{5}{16}$	x $\frac{3}{4}$	x3	x2	x3
$\frac{3}{8}$	$\frac{3}{8}$	x $\frac{7}{8}$	3-8x $\frac{5}{8}$	x $2\frac{1}{2}$	x4
$\frac{7}{16}$	$\frac{7}{16}$	x1	x $\frac{3}{4}$	x3	7-8x1
$\frac{1}{2}$	$\frac{1}{2}$	x $1\frac{1}{4}$	x1	5-8x1	x $1\frac{1}{4}$
$\frac{5}{8}$	$\frac{5}{8}$	x $\frac{13}{8}$	x $1\frac{1}{4}$	x $\frac{1}{4}$	x $\frac{13}{8}$
$\frac{3}{4}$	$\frac{3}{4}$	x $1\frac{1}{2}$	x $\frac{13}{8}$	x $1\frac{1}{2}$	x $1\frac{1}{2}$
$\frac{7}{8}$	$\frac{7}{8}$	x $1\frac{3}{4}$	x $1\frac{1}{2}$	x $\frac{13}{4}$	x2
1	1	x2	x $\frac{13}{4}$	x2	x3
$1\frac{1}{8}$	$1\frac{1}{8}$	x $2\frac{1}{4}$	x2	x $2\frac{1}{2}$	x4
$1\frac{1}{4}$	$1\frac{1}{4}$	x $2\frac{1}{2}$	x $2\frac{1}{2}$	x3	1x $1\frac{1}{4}$
$1\frac{3}{8}$	$\frac{13}{8}$	x3	x3	3-4x $\frac{7}{8}$	x $1\frac{1}{2}$
$1\frac{1}{2}$	$1\frac{1}{2}$	5-16x1	1-2x $\frac{3}{4}$	x1	x2
$1\frac{3}{4}$	$1\frac{3}{4}$	x $1\frac{1}{4}$	x1	x $1\frac{1}{4}$	x $2\frac{1}{2}$
2	2	x $\frac{13}{8}$	x $1\frac{1}{4}$	x $1\frac{1}{2}$	x3
$2\frac{1}{2}$	$2\frac{1}{4}$	x $1\frac{1}{2}$	x $\frac{13}{8}$	x $\frac{13}{4}$	x4
$2\frac{3}{4}$	$2\frac{1}{2}$	x $1\frac{3}{4}$	x $1\frac{1}{2}$	x2	x5
3	3	x2			
4	$3\frac{1}{2}$				

See Classification, page 242.

WRITE FOR TOOL STEEL BOOKLET AND PRICES.

SCULLY "SPECIAL" BRAND TOOL STEEL.

For Dies, Milling Cutters, Punches, Taps and Reamers.

Octagon	Round	Square	Flat	Flat	Flat
$\frac{1}{4}$	$\frac{1}{16}$	$\frac{5}{8}$	1-4x $\frac{13}{8}$	3-8x2	3-4x $1\frac{1}{2}$
$\frac{5}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	x $1\frac{1}{2}$	x $2\frac{1}{2}$	x $1\frac{3}{4}$
$\frac{3}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	x $1\frac{3}{4}$	x3	x2
$\frac{7}{16}$	$\frac{3}{4}$	1	x2	1-2x $\frac{3}{4}$	x $2\frac{1}{2}$
$\frac{1}{2}$	$\frac{7}{8}$	$1\frac{1}{8}$	x $2\frac{1}{4}$	x1	x3
$\frac{9}{16}$	1	$1\frac{1}{4}$	x3	x $1\frac{1}{4}$	x4
$\frac{5}{8}$	$1\frac{1}{8}$	$1\frac{3}{8}$	5-16x1	x $1\frac{3}{8}$	7-8x1
$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	x $1\frac{1}{4}$	x $1\frac{1}{2}$	x $1\frac{1}{4}$
$\frac{7}{8}$	$1\frac{3}{8}$	$1\frac{3}{4}$	x $1\frac{3}{8}$	x $1\frac{3}{4}$	x $1\frac{3}{8}$
1	$1\frac{1}{2}$	2	x $1\frac{3}{4}$	x $2\frac{1}{2}$	x2
$1\frac{1}{8}$	$1\frac{3}{4}$	$2\frac{1}{4}$	x2	x3	x3
$1\frac{1}{4}$	2	$2\frac{1}{2}$	x $2\frac{1}{2}$	5-8x1	x4
$1\frac{3}{8}$	$2\frac{1}{2}$	3	x3	x $1\frac{1}{4}$	1x $1\frac{1}{4}$
$1\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{2}$	3-8x $\frac{5}{8}$	x $1\frac{1}{2}$	x $1\frac{1}{2}$
$1\frac{3}{4}$	4	4	x $\frac{3}{4}$	x2	x2
2			x1	x $2\frac{1}{2}$	x $2\frac{1}{2}$
Round	Square	Flat			
$\frac{1}{4}$	$\frac{1}{4}$	1-4x $\frac{5}{8}$	x $1\frac{1}{4}$	3-4x $\frac{7}{8}$	x3
$\frac{5}{16}$	$\frac{5}{16}$	x $\frac{3}{4}$	x $1\frac{3}{8}$	x1	x4
$\frac{3}{8}$	$\frac{3}{8}$	x $\frac{7}{8}$	x $1\frac{1}{2}$	x $1\frac{1}{4}$	x5
$\frac{7}{16}$	$\frac{7}{16}$	x1	x $1\frac{3}{4}$		
$\frac{1}{2}$	$\frac{1}{2}$	x $1\frac{1}{4}$			

SCULLY "SPECIAL" ANNEALED.

Round	Square	Flat	Flat	Flat	Flat
$\frac{1}{4}$	$\frac{1}{4}$	3-16x $\frac{5}{8}$	1-4x3	1-2x $\frac{3}{4}$	7-8x $1\frac{3}{8}$
$\frac{5}{16}$	$\frac{5}{16}$	x $\frac{7}{8}$	5-16x $1\frac{1}{4}$	x1	x $1\frac{1}{2}$
$\frac{3}{8}$	$\frac{3}{8}$	x1	x $1\frac{3}{8}$	x $1\frac{1}{4}$	x2
$\frac{7}{16}$	$\frac{7}{16}$	x $1\frac{1}{8}$	x $1\frac{1}{2}$	x $1\frac{1}{2}$	x4
$\frac{1}{2}$	$\frac{1}{2}$	x $1\frac{1}{2}$	x $1\frac{3}{4}$	x2	5-8x1
$\frac{5}{8}$	$\frac{5}{8}$	x2	x2	x $2\frac{1}{2}$	x $1\frac{1}{2}$
$\frac{3}{4}$	$\frac{3}{4}$	1-4x $\frac{5}{8}$	x $2\frac{1}{2}$	x3	x $1\frac{3}{4}$
$\frac{7}{8}$	$\frac{7}{8}$	x $\frac{3}{4}$	x3	3-4x $\frac{7}{8}$	x $2\frac{1}{2}$
1	1	x $\frac{7}{8}$	3-8x $\frac{5}{8}$	x $1\frac{1}{4}$	x3
$1\frac{1}{8}$	$1\frac{1}{8}$	x1	x $\frac{3}{4}$	x $1\frac{1}{2}$	1x $1\frac{1}{4}$
$1\frac{1}{4}$	$1\frac{1}{4}$	x $1\frac{1}{4}$	x1	x $1\frac{3}{4}$	x $1\frac{1}{2}$
$1\frac{3}{8}$	$1\frac{1}{2}$	x $1\frac{3}{8}$	x $1\frac{1}{4}$	x2	x2
$1\frac{1}{2}$	2	x $1\frac{1}{2}$	x $1\frac{1}{2}$	x $2\frac{1}{2}$	x $2\frac{1}{2}$
$1\frac{3}{4}$	$2\frac{1}{4}$	x $1\frac{3}{4}$	x $1\frac{3}{4}$	x3	x3
$2\frac{1}{2}$	4	x2	x2	x4	x4
3		x $2\frac{1}{4}$	x $2\frac{1}{2}$	7-8x1	x5
4		x $2\frac{1}{2}$	x3	x $1\frac{1}{4}$	

See Classification, page 242.

WRITE FOR TOOL STEEL BOOKLET AND PRICES.

SCULLY HIGH SPEED TOOL STEEL.

"THE HIGH SPEED STEEL WITHOUT AN EQUAL."

Round	Round	Square	Flat	Flat	Flat
$\frac{1}{4}$	$1\frac{7}{8}$	$\frac{1}{4}$	1-4x $\frac{1}{2}$	3-8x1	3-4x1
$\frac{3}{8}$	2	$\frac{5}{16}$	x $\frac{3}{4}$	x1 $\frac{1}{4}$	x1 $\frac{1}{4}$
$\frac{1}{2}$	$2\frac{1}{8}$	$\frac{3}{8}$	x1	x1 $\frac{1}{2}$	x1 $\frac{1}{2}$
$\frac{5}{8}$	$2\frac{1}{4}$	$\frac{1}{2}$	x1 $\frac{1}{4}$	1-2x $\frac{3}{4}$	x2
$\frac{3}{4}$	$2\frac{1}{2}$	$\frac{5}{8}$	x1 $\frac{1}{2}$	x $\frac{7}{8}$	7-8x1 $\frac{1}{4}$
$\frac{7}{8}$	$2\frac{3}{4}$	$\frac{3}{4}$	5-16x $\frac{5}{8}$	x1	x1 $\frac{1}{2}$
1	3	$\frac{7}{8}$	x $\frac{3}{4}$	x1 $\frac{1}{4}$	x2
$1\frac{1}{8}$	$3\frac{1}{2}$	1	x1	x1 $\frac{1}{2}$	1x1 $\frac{1}{2}$
$1\frac{1}{4}$	4	$1\frac{1}{4}$	x1 $\frac{1}{4}$	5-8x1	x2
$1\frac{3}{8}$	$4\frac{1}{2}$	$1\frac{1}{2}$	x1 $\frac{1}{2}$	x1 $\frac{1}{4}$	1 1-2x2
$1\frac{1}{2}$	5	2	3-8x $\frac{3}{4}$	x1 $\frac{1}{2}$	x2 $\frac{1}{2}$
$1\frac{3}{4}$	6				

SCULLY ANNEALED HIGH SPEED TOOL STEEL.

Round	Round	Square	Flat
$\frac{1}{4}$	$1\frac{3}{4}$	$\frac{7}{8}$	1-4x1 $\frac{1}{2}$
$\frac{5}{16}$	2	1	5-16x $\frac{5}{8}$
$\frac{3}{8}$	Square	$1\frac{1}{4}$	x $\frac{3}{4}$
$\frac{1}{2}$		$1\frac{1}{2}$	x1
$\frac{5}{8}$		Flat	x1 $\frac{1}{4}$
$\frac{3}{4}$	$\frac{1}{4}$		x1 $\frac{1}{2}$
$\frac{7}{8}$	$\frac{5}{16}$	1-4x $\frac{1}{2}$	3-8x $\frac{3}{4}$
1	$\frac{3}{8}$	x $\frac{3}{4}$	x1
$1\frac{1}{4}$	$\frac{1}{2}$	x1	x1 $\frac{1}{4}$
$1\frac{1}{2}$	$\frac{5}{8}$	x1 $\frac{1}{4}$	x1 $\frac{1}{2}$
	$\frac{3}{4}$		

See Tool Steel Classification, page 242.

MERCHANT BAR IRON. IN STOCK.

ROUNDS.



Diam. in.	L'gth, feet	Est. Wt. per ft.	Diam. in.	L'gth, feet	Est. Wt. per ft.
Bdls. $\frac{5}{16}$	16	0.261	$1\frac{1}{4}$	16	4.173
$\frac{3}{8}$	16	0.375	$1\frac{3}{8}$	16	5.049
$\frac{7}{16}$	16	0.511	$1\frac{1}{2}$	16	6.008
$\frac{1}{2}$	16	0.667	$1\frac{5}{8}$	16	7.051
$\frac{9}{16}$	16	0.845	$1\frac{3}{4}$	16	8.178
$\frac{5}{8}$	16	1.043	2	16	10.68
Bars $\frac{3}{4}$	16	1.502	$2\frac{1}{4}$	16	13.52
$\frac{7}{8}$	16	2.044			
$1\frac{1}{8}$	16	2.347			
1	16	2.670			
$1\frac{1}{8}$	16	3.379			

SQUARES.



Size, inches	L'gth, feet	Est. Wt. per ft.	Size, inches	L'gth, feet	Est. Wt. per ft.
Bdls. $\frac{3}{8}$	16	0.478	$1\frac{1}{4}$	20	5.313
$\frac{7}{16}$	16	0.651	$1\frac{3}{8}$	16	6.428
$\frac{1}{2}$	16	0.850	$1\frac{1}{2}$	16	7.650
$\frac{9}{16}$	16	1.076	$1\frac{3}{4}$	16	10.410
$\frac{5}{8}$	16	1.328	2	16	13.600
Bars $\frac{3}{4}$	18	1.913	$2\frac{1}{2}$	16	21.050
$\frac{7}{8}$	18	2.603			
1	18	3.400			
$1\frac{1}{8}$	18	4.303			

FLATS.



Size, inches	L'gth, feet	Est. Wt. per ft.	Size, inches	L'gth, feet	Est. Wt. per ft.
$\frac{1}{4} \times \frac{3}{4}$	14	.64	$\frac{1}{4} \times 2\frac{1}{4}$	16	1.91
$\frac{1}{4} \times \frac{7}{8}$	16	.745	$\frac{1}{4} \times 2\frac{1}{2}$	16	2.12
$\frac{1}{4} \times 1$	16	.850	$\frac{1}{4} \times 2\frac{3}{4}$	16	2.34
$\frac{1}{4} \times 1\frac{1}{8}$	14	.955	$\frac{1}{4} \times 3$	16	2.55
$\frac{1}{4} \times 1\frac{1}{4}$	16	1.06	$\frac{1}{4} \times 3\frac{1}{2}$	16	2.98
$\frac{1}{4} \times 1\frac{3}{8}$	14	1.17	$\frac{1}{4} \times 4$	16	3.40
$\frac{1}{4} \times 1\frac{1}{2}$	16	1.28	$\frac{1}{4} \times 4\frac{1}{2}$	16	3.83
$\frac{1}{4} \times 1\frac{3}{4}$	16	1.49	$\frac{1}{4} \times 5$	16	4.24
$\frac{1}{4} \times 2$	16	1.70	$\frac{1}{4} \times 5\frac{1}{2}$	16	4.67

Other sizes shipped promptly from mills.

For Classification see page 243.

WRITE FOR PRICES.

MERCHANT BAR IRON.—Continued.**IN STOCK.****FLATS.** 

Size, in.	Length, ft.	Est. Wt. per ft.	Size, in.	Length, ft.	Est. Wt. per ft.
$\frac{5}{16} \times \frac{3}{4}$	14	.795	$\frac{3}{8} \times 4\frac{1}{2}$	16	5.74
$\frac{5}{16} \times \frac{7}{8}$	14	.93	$\frac{3}{8} \times 5$	16	6.38
$\frac{5}{16} \times 1$	16	1.06	$\frac{3}{8} \times 5\frac{1}{2}$	16	7.02
$\frac{5}{16} \times 1\frac{1}{8}$	14	1.19	$\frac{7}{16} \times 1\frac{1}{4}$	14	1.86
$\frac{5}{16} \times 1\frac{1}{4}$	16	1.33	$\frac{7}{16} \times 1\frac{1}{2}$	16	2.23
$\frac{5}{16} \times 1\frac{3}{8}$	16	1.46	$\frac{7}{16} \times 1\frac{3}{4}$	16	2.60
$\frac{5}{16} \times 1\frac{1}{2}$	16	1.59	$\frac{7}{16} \times 2$	16	2.98
$\frac{5}{16} \times 1\frac{3}{4}$	16	1.86	$\frac{7}{16} \times 2\frac{1}{2}$	16	3.72
$\frac{5}{16} \times 2$	16	2.12	$\frac{7}{16} \times 3$	14	4.46
$\frac{5}{16} \times 2\frac{1}{4}$	16	2.39	$\frac{7}{16} \times 3\frac{1}{2}$	16	5.20
$\frac{5}{16} \times 2\frac{1}{2}$	16	2.65	$\frac{7}{16} \times 4\frac{1}{2}$	16	6.70
$\frac{5}{16} \times 2\frac{3}{4}$	16	2.92	$\frac{1}{2} \times \frac{3}{4}$	14	1.27
$\frac{5}{16} \times 3$	16	3.19	$\frac{1}{2} \times \frac{7}{8}$	14	1.49
$\frac{5}{16} \times 3\frac{1}{4}$	16	3.45	$\frac{1}{2} \times 1$	16	1.70
$\frac{5}{16} \times 3\frac{1}{2}$	16	3.72	$\frac{1}{2} \times 1\frac{1}{8}$	14	1.91
$\frac{5}{16} \times 4$	16	4.25	$\frac{1}{2} \times 1\frac{1}{4}$	16	2.12
$\frac{5}{16} \times 4\frac{1}{2}$	16	4.78	$\frac{1}{2} \times 1\frac{3}{8}$	16	2.33
$\frac{5}{16} \times 5$	16	5.31	$\frac{1}{2} \times 1\frac{1}{2}$	16	2.55
$\frac{5}{16} \times 5\frac{1}{2}$	16	5.84	$\frac{1}{2} \times 1\frac{5}{8}$	16	2.76
$\frac{3}{8} \times 1$	16	1.28	$\frac{1}{2} \times 1\frac{3}{4}$	16	2.98
$\frac{3}{8} \times 1\frac{1}{8}$	16	1.43	$\frac{1}{2} \times 2$	16	3.40
$\frac{3}{8} \times 1\frac{1}{4}$	16	1.59	$\frac{1}{2} \times 2\frac{1}{4}$	16	3.83
$\frac{3}{8} \times 1\frac{3}{8}$	16	1.74	$\frac{1}{2} \times 2\frac{1}{2}$	16	4.25
$\frac{3}{8} \times 1\frac{1}{2}$	16	1.92	$\frac{1}{2} \times 3$	16	5.10
$\frac{3}{8} \times 1\frac{5}{8}$	16	2.07	$\frac{1}{2} \times 3\frac{1}{2}$	16	5.95
$\frac{3}{8} \times 1\frac{3}{4}$	16	2.23	$\frac{1}{2} \times 4$	16	6.80
$\frac{3}{8} \times 2$	16	2.55	$\frac{1}{2} \times 4\frac{1}{2}$	16	7.65
$\frac{3}{8} \times 2\frac{1}{4}$	16	2.87	$\frac{1}{2} \times 5$	16	8.50
$\frac{3}{8} \times 2\frac{1}{2}$	16	3.19	$\frac{1}{2} \times 5\frac{1}{2}$	16	9.35
$\frac{3}{8} \times 2\frac{3}{4}$	16	3.48	$\frac{1}{2} \times 6$	16	10.20
$\frac{3}{8} \times 3$	16	3.83	$\frac{1}{2} \times 6\frac{1}{2}$	16	11.05
$\frac{3}{8} \times 3\frac{1}{4}$	16	4.15	$\frac{9}{16} \times 1\frac{1}{4}$	14	2.39
$\frac{3}{8} \times 3\frac{1}{2}$	16	4.47	$\frac{9}{16} \times 1\frac{1}{2}$	16	2.87
$\frac{3}{8} \times 4$	16	5.10	$\frac{9}{16} \times 1\frac{3}{4}$	16	3.35

Other sizes shipped promptly from mills.
For Classification see page 243.

WRITE FOR PRICES.

MERCHANT BAR IRON.—Continued. **IN STOCK.**

FLATS.

Size, in.	Length, ft.	Est. Wt. per ft.	Size, in.	Length, ft.	Est. Wt. per ft.
$\frac{9}{16} \times 2\frac{1}{2}$	16	4.78	$\frac{7}{8} \times 2$	16	5.95
$\frac{9}{16} \times 2\frac{3}{4}$	16	5.26	$\frac{7}{8} \times 2\frac{1}{4}$	16	6.69
$\frac{9}{16} \times 3$	16	5.74	$\frac{7}{8} \times 2\frac{1}{2}$	16	7.44
$\frac{5}{8} \times 1$	14	2.12	$\frac{7}{8} \times 2\frac{3}{4}$	16	8.18
$\frac{5}{8} \times 1\frac{1}{4}$	16	2.65	$\frac{7}{8} \times 3$	16	8.93
$\frac{5}{8} \times 1\frac{1}{2}$	16	3.19	$\frac{7}{8} \times 3\frac{1}{4}$	16	9.67
$\frac{5}{8} \times 1\frac{5}{8}$	16	3.45	$\frac{7}{8} \times 3\frac{1}{2}$	16	10.41
$\frac{5}{8} \times 1\frac{3}{4}$	16	3.72	$\frac{7}{8} \times 4$	16	11.90
$\frac{5}{8} \times 2$	16	4.25	$\frac{7}{8} \times 4\frac{1}{2}$	16	13.39
$\frac{5}{8} \times 2\frac{1}{4}$	16	4.78	1 $\times 1\frac{1}{2}$	16	5.10
$\frac{5}{8} \times 2\frac{1}{2}$	16	5.31	1 $\times 1\frac{3}{4}$	16	5.95
$\frac{5}{8} \times 2\frac{3}{4}$	16	5.84	1 $\times 2$	16	6.80
$\frac{5}{8} \times 3$	16	6.38	1 $\times 2\frac{1}{4}$	16	7.65
$\frac{5}{8} \times 3\frac{1}{4}$	16	6.91	1 $\times 2\frac{1}{2}$	16	8.50
$\frac{5}{8} \times 3\frac{1}{2}$	16	7.44	1 $\times 2\frac{3}{4}$	16	9.35
$\frac{5}{8} \times 4$	16	8.50	1 $\times 3$	16	10.20
$\frac{5}{8} \times 4\frac{1}{2}$	16	9.57	1 $\times 3\frac{1}{4}$	16	10.95
$\frac{5}{8} \times 5$	16	10.63	1 $\times 3\frac{1}{2}$	16	11.90
$\frac{5}{8} \times 5\frac{1}{2}$	16	11.68	1 $\times 3\frac{3}{4}$	16	12.63
$\frac{5}{8} \times 6$	16	12.75	1 $\times 4$	16	13.60
$\frac{3}{4} \times 1$	16	2.55	1 $\times 4\frac{1}{2}$	16	15.30
$\frac{3}{4} \times 1\frac{1}{8}$	16	2.87	1 $\times 5$	16	17.00
$\frac{3}{4} \times 1\frac{1}{4}$	16	3.19	1 $\times 5\frac{1}{2}$	16	18.70
$\frac{3}{4} \times 1\frac{1}{2}$	16	3.83	1 $\times 6$	16	20.40
$\frac{3}{4} \times 1\frac{3}{4}$	16	4.47	$1\frac{1}{4} \times 1\frac{3}{4}$	16	7.29
$\frac{3}{4} \times 2$	16	5.10	$1\frac{1}{4} \times 2\frac{1}{4}$	16	9.38
$\frac{3}{4} \times 2\frac{1}{4}$	16	5.75	$1\frac{1}{4} \times 2\frac{3}{4}$	16	11.46
$\frac{3}{4} \times 2\frac{1}{2}$	16	6.38	$1\frac{1}{4} \times 3$	16	12.50
$\frac{3}{4} \times 2\frac{3}{4}$	16	7.02	$1\frac{1}{4} \times 3\frac{1}{4}$	16	13.68
$\frac{3}{4} \times 3$	16	7.65	$1\frac{1}{4} \times 4$	16	16.66
$\frac{3}{4} \times 3\frac{1}{4}$	16	8.21	$1\frac{1}{4} \times 4\frac{1}{2}$	16	18.76
$\frac{3}{4} \times 3\frac{1}{2}$	16	8.93	$1\frac{1}{4} \times 5\frac{1}{2}$	16	22.92
$\frac{3}{4} \times 4$	16	10.20	$1\frac{1}{2} \times 1\frac{3}{4}$	16	8.75
$\frac{3}{4} \times 4\frac{1}{2}$	16	11.48	$1\frac{1}{2} \times 2\frac{3}{4}$	16	13.75
$\frac{3}{4} \times 5$	16	12.75	$1\frac{1}{2} \times 4$	16	20.00
$\frac{3}{4} \times 5\frac{1}{2}$	16	14.03	$1\frac{3}{4} \times 2\frac{3}{4}$	16	16.04
$\frac{3}{4} \times 6$	16	15.30	2 $\times 3\frac{1}{2}$	16	23.34
$\frac{7}{8} \times 1\frac{1}{2}$	16	4.47	2 $\times 5$	16	33.33
$\frac{7}{8} \times 1\frac{3}{4}$	16	5.20			

Other sizes shipped promptly from mills.
 See Classification on page 243.

WRITE FOR PRICES.



STAY-BOLT IRON.

This is a high-grade, clean, extra puddled, refined iron, exceedingly tough and solid, combining a sufficiently high tensile strength with great ductility. Suitable for stay bolts, chain, forgings and general work.

SIZES CARRIED IN STOCK.

ROUND.

Diameter in inches.	Length in feet.	Est. Weight per foot.	Diameter in inches.	Length in feet.	Est. Weight per foot.
$\frac{1}{2}$	18	.667	1	18	2.670
$\frac{5}{8}$	18	1.043	$1\frac{1}{8}$	18	3.014
$\frac{11}{16}$	18	1.262	$1\frac{1}{4}$	18	3.379
$\frac{3}{4}$	18	1.502	$1\frac{3}{8}$	18	4.173
$\frac{13}{16}$	18	1.773	$1\frac{1}{2}$	18	5.049
$\frac{7}{8}$	18	2.044			
$1\frac{1}{8}$	18	2.347			

Other sizes furnished promptly from mills.

Same classification as Bar Iron. See page 243.

We can furnish from mills, refined, double-refined and high-grade irons of all kinds.

WRITE FOR PRICES.

NORWAY IRON BARS.

IN STOCK—ROUNDS.

Dia. Inches	Length Feet	Est. Wt. per Foot	Dia. Inches	Length Feet	Est. Wt. per Foot
Bdls.			Bars.		
$\frac{1}{4}$	10 to 12	0.167	$1\frac{3}{8}$	14 to 16	5.049
$\frac{5}{16}$	10 to 12	0.261	$1\frac{1}{2}$	14 to 16	6.008
$\frac{3}{8}$	10 to 12	0.375	$1\frac{5}{8}$	14 to 16	7.051
$\frac{7}{16}$	10 to 12	0.511	$1\frac{3}{4}$	14 to 16	8.178
$\frac{1}{2}$	10 to 12	0.667	2	14 to 16	10.68
$\frac{9}{16}$	10 to 12	0.845	$2\frac{1}{4}$	14 to 16	13.52
$\frac{5}{8}$	10 to 12	1.043	$2\frac{3}{8}$	14 to 16	15.07
$\frac{3}{4}$	10 to 12	1.502	$2\frac{1}{2}$	14 to 16	16.69
$\frac{7}{8}$	10 to 12	2.044	$2\frac{3}{4}$	14 to 16	20.20
Bars.			3	14 to 16	24.03
1	10 to 12	2.670	$3\frac{1}{2}$	10 to 12	32.73
$1\frac{1}{8}$	14 to 16	3.379	4	10 to 12	42.75
$1\frac{1}{4}$	14 to 16	4.173			

SQUARES.

Dia. Inches	Length Feet	Est. Wt. per Foot	Dia. Inches	Length Feet	Est. Wt. per Foot
Bdls.			Bars.		
$\frac{1}{4}$	10 to 12	0.212	$1\frac{1}{4}$	10 to 16	5.313
$\frac{5}{16}$	10 to 12	0.332	$1\frac{3}{8}$	10 to 16	6.428
$\frac{3}{8}$	10 to 12	0.478	$1\frac{1}{2}$	10 to 16	7.650
$\frac{7}{16}$	10 to 12	0.651	$1\frac{5}{8}$	10 to 16	8.978
$\frac{1}{2}$	10 to 12	0.850	$1\frac{3}{4}$	10 to 16	10.41
$\frac{9}{16}$	10 to 12	1.076	2	10 to 16	13.60
$\frac{5}{8}$	10 to 12	1.328	$2\frac{1}{4}$	10 to 16	17.21
$\frac{3}{4}$	10 to 12	1.913	$2\frac{1}{2}$	10 to 14	21.25
Bars.			$2\frac{3}{4}$	14	25.71
$\frac{7}{8}$	10 to 12	2.603	3	6 to 12	30.60
1	10 to 16	3.400	$3\frac{1}{2}$	5' 8" to 8' 8"	41.65
$1\frac{1}{8}$	10 to 16	4.303	4	4 to 7	54.40

FLATS.

Size Inches	Length Feet	Est. Wt. per Foot	Size Inches	Length Feet	Est. Wt. per Foot
Bdls.			Bars.		
$\frac{3}{16} \times \frac{3}{4}$	10 to 12	.478	$\frac{1}{4} \times 3$	10 to 14	2.55
$\frac{1}{8} \times \frac{7}{8}$	10 to 12	.555	$\frac{5}{16} \times \frac{5}{8}$	11 to 14	.66
$\frac{1}{4} \times \frac{3}{4}$	11 to 14	.640	$\frac{1}{8} \times \frac{3}{4}$	11 to 14	.79
$\frac{1}{4} \times \frac{7}{8}$	11 to 14	.745	$\frac{5}{16} \times \frac{7}{8}$	11 to 14	.93
$\frac{1}{4} \times 1$	11 to 14	.850	$\frac{5}{16} \times 1$	11 to 14	1.06
$\frac{1}{4} \times 1\frac{1}{8}$	11 to 14	.955	$\frac{1}{8} \times 1\frac{1}{8}$	11 to 14	1.19
$\frac{1}{4} \times 1\frac{1}{4}$	11 to 14	1.06	$\frac{5}{16} \times 1\frac{1}{4}$	11 to 14	1.33
$\frac{1}{4} \times 1\frac{1}{2}$	11 to 14	1.28	$\frac{5}{16} \times 1\frac{1}{2}$	11 to 14	1.59
$\frac{1}{4} \times 1\frac{3}{4}$	10 to 14	1.49	$\frac{5}{16} \times 1\frac{3}{4}$	11 to 14	1.86
Bars.			$\frac{5}{16} \times 2$	11 to 14	2.12
$\frac{1}{4} \times 2$	10 to 14	1.70	$\frac{5}{16} \times 2\frac{1}{4}$	11 to 14	2.39
$\frac{1}{4} \times 2\frac{1}{4}$	10 to 14	1.91	$\frac{5}{16} \times 2\frac{1}{2}$	11 to 14	2.65
$\frac{1}{4} \times 2\frac{1}{2}$	10 to 14	2.12	$\frac{5}{16} \times 3$	11 to 14	3.19

See Classification on page 244.

WRITE FOR PRICES.

NORWAY IRON BARS.—Continued.**FLATS—IN STOCK.**

Size Inches Bars.	Length Feet	Est. Wt. per Foot	Size Inches Bars.	Length Feet	Est. Wt. per Foot
$\frac{3}{8} \times \frac{1}{2}$	10 to 15	.64	$\frac{3}{4} \times 1$	13 to 16	2.55
$\frac{3}{8} \times \frac{3}{4}$	10 to 15	.96	$\frac{3}{4} \times 1\frac{1}{8}$	13 to 16	2.87
$\frac{3}{8} \times \frac{7}{8}$	10 to 15	1.11	$\frac{3}{4} \times 1\frac{1}{4}$	13 to 16	3.19
$\frac{3}{8} \times 1$	10 to 15	1.28	$\frac{3}{4} \times 1\frac{1}{2}$	13 to 16	3.83
$\frac{3}{8} \times 1\frac{1}{8}$	10 to 15	1.43	$\frac{3}{4} \times 1\frac{3}{4}$	13 to 16	4.47
$\frac{3}{8} \times 1\frac{1}{4}$	10 to 15	1.59	$\frac{3}{4} \times 2$	13 to 16	5.10
$\frac{3}{8} \times 1\frac{1}{2}$	10 to 15	1.92	$\frac{3}{4} \times 2\frac{1}{4}$	13 to 16	5.75
$\frac{3}{8} \times 1\frac{3}{4}$	10 to 15	2.23	$\frac{3}{4} \times 2\frac{1}{2}$	13 to 16	6.38
$\frac{3}{8} \times 2$	10 to 15	2.55	$\frac{3}{4} \times 2\frac{3}{4}$	13 to 16	7.02
$\frac{3}{8} \times 2\frac{1}{4}$	10 to 15	2.87	$\frac{3}{4} \times 3$	13 to 16	7.65
$\frac{3}{8} \times 2\frac{1}{2}$	10 to 15	3.19	$\frac{3}{4} \times 4$	13 to 16	10.20
$\frac{3}{8} \times 2\frac{3}{4}$	10 to 15	3.51	$\frac{3}{4} \times 4\frac{1}{2}$	13 to 16	11.48
$\frac{3}{8} \times 3$	10 to 15	3.83	$\frac{3}{4} \times 5$	13 to 16	12.75
$\frac{3}{8} \times 3\frac{1}{2}$	10 to 15	4.47	$\frac{3}{4} \times 5\frac{1}{2}$	13 to 16	13.89
$\frac{3}{8} \times 4$	10 to 15	5.10	$\frac{7}{8} \times 1\frac{1}{2}$	13 to 16	4.47
$\frac{1}{2} \times 1$	10 to 15	1.70	$\frac{7}{8} \times 1\frac{3}{4}$	13 to 16	5.20
$\frac{1}{2} \times 1\frac{1}{8}$	10 to 15	1.91	$\frac{7}{8} \times 2$	13 to 16	5.95
$\frac{1}{2} \times 1\frac{1}{4}$	10 to 15	2.12	$\frac{7}{8} \times 2\frac{1}{4}$	13 to 16	6.69
$\frac{1}{2} \times 1\frac{1}{2}$	10 to 15	2.55	$\frac{7}{8} \times 2\frac{1}{2}$	13 to 16	7.44
$\frac{1}{2} \times 1\frac{3}{4}$	10 to 15	2.98	$\frac{7}{8} \times 2\frac{3}{4}$	13 to 16	8.10
$\frac{1}{2} \times 2$	10 to 15	3.40	$\frac{7}{8} \times 3$	13 to 16	8.93
$\frac{1}{2} \times 2\frac{1}{4}$	10 to 15	3.83	$\frac{7}{8} \times 3\frac{1}{2}$	13 to 16	10.41
$\frac{1}{2} \times 2\frac{1}{2}$	10 to 15	4.25	$\frac{7}{8} \times 4$	13 to 16	11.90
$\frac{1}{2} \times 2\frac{3}{4}$	10 to 15	4.67	1 $\times 1\frac{1}{2}$	13 to 16	5.10
$\frac{1}{2} \times 3$	10 to 15	5.10	1 $\times 1\frac{3}{4}$	13 to 16	5.95
$\frac{1}{2} \times 3\frac{1}{4}$	10 to 15	5.53	1 $\times 2$	13 to 16	6.80
$\frac{1}{2} \times 3\frac{1}{2}$	10 to 15	5.95	1 $\times 2\frac{1}{4}$	13 to 16	7.65
$\frac{1}{2} \times 4$	10 to 15	6.80	1 $\times 2\frac{1}{2}$	13 to 16	8.50
$\frac{1}{2} \times 4\frac{1}{2}$	10 to 15	7.65	1 $\times 2\frac{3}{4}$	13 to 16	9.26
$\frac{1}{2} \times 5$	10 to 15	8.50	1 $\times 3$	13 to 16	10.20
$\frac{1}{2} \times 5\frac{1}{2}$	10 to 15	9.26	1 $\times 3\frac{1}{2}$	13 to 16	11.90
$\frac{5}{8} \times 1\frac{1}{4}$	13 to 16	2.65	1 $\times 4$	13 to 16	13.60
$\frac{5}{8} \times 1\frac{1}{2}$	13 to 16	3.19	1 $\times 5$	13 to 16	17.00
$\frac{5}{8} \times 1\frac{3}{4}$	13 to 16	3.72	1 $\times 5\frac{1}{2}$	13 to 16	18.52
$\frac{5}{8} \times 2$	13 to 16	4.25	$1\frac{1}{4} \times 2\frac{1}{4}$	12' 6" - 14' 6"	9.57
$\frac{5}{8} \times 2\frac{1}{4}$	13 to 16	4.78	$1\frac{1}{4} \times 2\frac{1}{2}$	12' 6" - 14'	10.63
$\frac{5}{8} \times 2\frac{1}{2}$	13 to 16	5.31	$1\frac{1}{2} \times 2\frac{1}{4}$	10 to 16	11.48
$\frac{5}{8} \times 2\frac{3}{4}$	13 to 16	5.84	$1\frac{1}{2} \times 2\frac{1}{2}$	10 to 16	12.75
$\frac{5}{8} \times 3$	13 to 16	6.38	$1\frac{1}{2} \times 3$	10 to 16	15.30
$\frac{5}{8} \times 3\frac{1}{4}$	13 to 16	6.84	$1\frac{1}{2} \times 3\frac{1}{2}$	10 to 16	17.85
$\frac{5}{8} \times 3\frac{1}{2}$	13 to 16	7.44	$1\frac{1}{2} \times 4$	10 to 16	20.40
$\frac{5}{8} \times 4$	13 to 16	8.50	2 $\times 3$	10 to 12	20.40
$\frac{5}{8} \times 4\frac{1}{2}$	13 to 16	9.57	2 $\times 4$	7 to 11	27.20
$\frac{5}{8} \times 5$	13 to 16	10.63	2 $\times 5$	7 to 11	34.00
$\frac{5}{8} \times 5\frac{1}{2}$	13 to 16	11.58	2 $\times 6$	7 to 11	40.80
$\frac{5}{8} \times 6$	13 to 16	12.75			

See Classification on page 244.

WRITE FOR PRICES.

ORNAMENTAL WROUGHT IRON MOULDINGS.

For Store Fronts, Stairways, Fences, Elevators, Etc.



No. a1131.



No. 3470.



No. 3499.
IN STOCK.

We call the attention of architects, architectural iron workers and foundries to this new line of Ornamental Wrought Iron Mouldings, which we have lately added to our stock, and are prepared to fill orders from store on all standard sections.

We will soon issue our booklet showing our entire assortment, and gladly furnish you a copy on application. In the meantime, you can order from us, specifying the numbers which you have been in the habit of ordering. Below find a list, giving the number of the section we carry in store at the present. These mouldings we carry in 18-foot bars. In this issue we show only a few sections, merely calling your attention to same.

NUMBERS OF SECTIONS CARRIED IN STOCK. ORDER BY NUMBER.

No. 5016	No. 2242	No. 3499	No. 3576	No. 2742	No. 1919
5054	2243	3500	3582	2743	1920
5066	5394	1507	3583	3787	1921
5067	5395	3530	3584	3782	1922
5068	5396	3531	2632	3783	5933
5069	5397	4554	2637	3784	5934
7142	3468	4555	2641	3785	5935
5205	3469	3561	2645	3886	a1127
5206	3470	3562	1681	3887	a1128
5207	3472	1563	1682	3888	a1129
7215	3495	3564	3685	3892	a1130
7216	3496	3565	2737	2902	a1131
7217	3497	3567	2739	2903	
7218	3498	3575	2741	2904	

WRITE FOR PRICES AND BOOKLET.

LAG OR COACH SCREWS.

IN STOCK.



GIMLET POINT, PRICE PER 100.

List of November 12th, 1908.

Length in inches	$\frac{1}{4}$ & $\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
$1\frac{1}{2}$	\$2.25	\$2.70	\$3.15	\$3.75				
2	2.45	2.96	3.47	4.11	\$ 6.00			
$2\frac{1}{2}$	2.65	3.22	3.79	4.47	6.50	\$ 9.20		
3	2.85	3.48	4.11	4.83	7.00	9.90	\$15.00	
$3\frac{1}{2}$	3.05	3.74	4.43	5.19	7.50	10.60	16.00	\$22.00
4	3.25	4.00	4.75	5.55	8.00	11.30	17.00	23.30
$4\frac{1}{2}$	3.45	4.26	5.07	5.91	8.50	12.00	18.00	24.60
5	3.65	4.52	5.39	6.27	9.00	12.70	19.00	25.90
$5\frac{1}{2}$	3.85	4.78	5.71	6.63	9.50	13.40	20.00	27.20
6	4.05	5.04	6.03	6.99	10.00	14.10	21.00	28.50
$6\frac{1}{2}$			6.35	7.35	10.50	14.80	22.00	29.80
7			6.67	7.71	11.00	15.50	23.00	31.10
$7\frac{1}{2}$			6.99	8.07	11.50	16.20	24.00	32.40
8			7.31	8.43	12.00	16.90	25.00	33.70
9			7.95	9.15	13.00	18.30	27.00	36.30
10				9.87	14.00	19.70	29.00	38.90
11				10.59	15.00	21.10	31.00	41.50
12				11.31	16.00	22.50	33.00	44.10

Hexagon Heads, 10 per cent. extra.

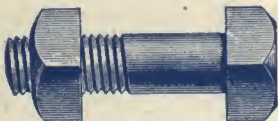
Tee Heads, 20 per cent. extra.

Skein Screws, list price, same as Lag Screws.

WRITE FOR DISCOUNTS.

MACHINE BOLTS.

With Square Heads, Square Nuts and Finished Points.



List prices per 100 bolts.

IN STOCK.

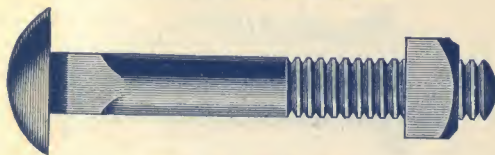
Length in Inches	Diameter of Bolt.										
	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$
$\frac{3}{4}$ to 1 $\frac{1}{2}$	\$1.70	\$2.00	\$2.40	\$2.80	\$3.60	\$5.20	\$7.20	\$10.50	\$15.10	\$22.50	\$30.00
2	1.78	2.12	2.56	3.00	3.86	5.58	7.70	11.20	16.00	23.70	31.50
2 $\frac{1}{2}$	1.86	2.24	2.72	3.20	4.12	5.96	8.20	11.90	16.90	24.90	33.00
3	1.94	2.36	2.88	3.40	4.38	6.34	8.70	12.60	17.80	26.10	34.50
3 $\frac{1}{2}$	2.02	2.48	3.04	3.60	4.64	6.72	9.20	13.30	18.70	27.30	36.00
4	2.10	2.60	3.20	3.80	4.90	7.10	9.70	14.00	19.60	28.50	37.50
4 $\frac{1}{2}$	2.18	2.72	3.36	4.00	5.16	7.48	10.20	14.70	20.50	29.70	39.00
5	2.26	2.84	3.52	4.20	5.42	7.86	10.70	15.40	21.40	30.90	40.50
5 $\frac{1}{2}$	2.34	2.96	3.68	4.40	5.68	8.24	11.20	16.10	22.30	32.10	42.00
6	2.42	3.08	3.84	4.60	5.94	8.62	11.70	16.80	23.20	33.30	43.50
6 $\frac{1}{2}$	2.50	3.20	4.00	4.80	6.20	9.00	12.20	17.50	24.10	34.50	45.00
7	2.58	3.32	4.16	5.00	6.46	9.38	12.70	18.20	25.00	35.70	46.50
7 $\frac{1}{2}$	2.66	3.44	4.32	5.20	6.72	9.76	13.20	18.90	25.90	36.90	48.00
8	2.74	3.56	4.48	5.40	6.98	10.14	13.70	19.60	26.80	38.10	49.50
9	2.90	3.80	4.80	5.80	7.50	10.90	14.70	21.00	28.60	40.50	52.50
10	3.06	4.04	5.12	6.20	8.02	11.66	15.70	22.40	30.40	42.90	55.50
11	3.22	4.28	5.44	6.60	8.54	12.42	16.70	23.80	32.20	45.30	58.50
12	3.38	4.52	5.76	7.00	9.06	13.18	17.70	25.20	34.00	47.70	61.50
13	3.54	4.76	6.08	7.40	9.58	13.94	18.70	26.60	35.80	50.10	64.50
14	3.70	5.00	6.40	7.80	10.10	14.70	19.70	28.00	37.60	52.50	67.50
15	3.86	5.24	6.72	8.20	10.62	15.46	20.70	29.40	39.40	54.90	70.50
16	4.02	5.48	7.04	8.60	11.14	16.22	21.70	30.80	41.20	57.30	73.50
17	4.18	5.72	7.36	9.00	11.66	16.98	22.70	32.20	43.00	59.70	76.50
18	4.34	5.96	7.68	9.40	12.18	17.74	23.70	33.60	44.80	62.10	79.50
19	4.50	6.20	8.00	9.80	12.70	18.50	24.70	35.00	46.60	64.50	82.50
20	4.66	6.44	8.32	10.20	13.22	19.26	25.70	36.40	48.40	66.90	85.50
21	...	...	...	...	...	...	26.70	37.80	50.20	69.30	88.50
22	...	...	...	...	...	...	27.70	39.20	52.00	71.70	91.50
23	...	...	...	...	...	...	28.70	40.60	53.80	74.10	94.50
24	...	...	...	...	...	...	29.70	42.00	55.60	76.50	97.50
25	...	...	...	...	...	...	30.70	43.40	57.40	78.90	100.50
26	...	...	...	...	...	...	31.70	44.80	59.20	81.30	103.50
27	...	...	...	...	...	...	32.70	46.20	61.00	83.70	106.50
28	...	...	...	...	...	...	33.70	47.60	62.80	86.10	109.50
29	...	...	...	...	...	...	34.70	49.00	64.60	88.50	112.50
30	...	...	...	...	...	...	35.70	50.40	66.40	90.90	115.50

With hexagon heads and hexagon nuts, add to list on machine bolts.....20%

With hexagon head and square nut or square head and hexagon nut, add to list of machine bolts.....10%

Special bolts made to order promptly in Chicago.

WRITE FOR DISCOUNTS.

CARRIAGE BOLTS.**COMMON—IN STOCK.**

Adopted May 19, 1908, to take effect June 1, 1908. PRICE PER 100.

Length	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$
$1\frac{1}{2}$	\$1.00	\$1.40	\$1.90	\$2.20	\$ 3.00	\$ 5.20	\$ 7.20
$1\frac{3}{4}$	1.04	1.46	1.98	2.29	3.00	5.20	7.20
2	1.08	1.52	2.06	2.38	3.00	5.20	7.20
$2\frac{1}{4}$	1.12	1.58	2.14	2.47	3.00	5.20	7.20
$2\frac{1}{2}$	1.16	1.64	2.22	2.56	3.00	5.20	7.20
$2\frac{3}{4}$	1.20	1.70	2.30	2.65	3.11	5.37	7.43
3	1.24	1.76	2.38	2.74	3.22	5.54	7.66
$3\frac{1}{4}$	1.28	1.82	2.46	2.83	3.33	5.71	7.89
$3\frac{1}{2}$	1.32	1.88	2.54	2.92	3.44	5.88	8.12
$3\frac{3}{4}$	1.36	1.94	2.62	3.01	3.55	6.05	8.35
4	1.40	2.00	2.70	3.10	3.66	6.22	8.58
$4\frac{1}{4}$	1.44	2.06	2.78	3.19	3.77	6.39	8.81
$4\frac{1}{2}$	1.48	2.12	2.86	3.28	3.88	6.56	9.04
$4\frac{3}{4}$	1.52	2.18	2.94	3.37	3.99	6.73	9.27
5	1.56	2.24	3.02	3.46	4.10	6.90	9.50
$5\frac{1}{2}$	1.64	2.36	3.18	3.64	4.32	7.24	9.96
6	1.72	2.48	3.34	3.82	4.54	7.58	10.42
$6\frac{1}{2}$	1.80	2.60	3.50	4.00	4.76	7.92	10.88
7	1.88	2.72	3.66	4.18	4.98	8.26	11.34
$7\frac{1}{2}$	1.96	2.84	3.82	4.36	5.20	8.60	11.80
8	2.04	2.96	3.98	4.54	5.42	8.94	12.26
$8\frac{1}{2}$	2.12	3.08	4.14	4.72	5.64	9.28	12.72
9	2.20	3.20	4.30	4.90	5.86	9.62	13.18
$9\frac{1}{2}$	2.28	3.32	4.46	5.08	6.08	9.96	13.64
10	2.36	3.44	4.62	5.26	6.30	10.30	14.10
11	2.52	3.68	4.94	5.62	6.74	10.98	15.02
12	2.68	3.92	5.26	5.98	7.18	11.66	15.94
13	2.84	4.16	5.58	6.34	7.62	12.34	16.86
14	3.00	4.40	5.90	6.70	8.06	13.02	17.78
15	3.16	4.64	6.22	7.06	8.50	13.70	18.70
16	3.32	4.88	6.54	7.42	8.94	14.38	19.62
17	3.48	5.12	6.86	7.78	9.38	15.06	20.54
18	3.64	5.36	7.18	8.14	9.82	15.74	21.46
19	3.80	5.60	7.50	8.50	10.26	16.42	22.38
20	3.96	5.84	7.82	8.86	10.70	17.10	23.30

WRITE FOR DISCOUNTS.

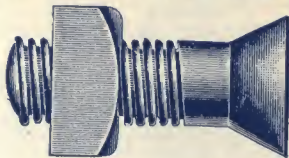
STOVE BOLTS.**IN STOCK.****FLAT HEAD. .****ROUND HEAD.**

List of March 1, 1907. PRICE PER 100.

Size Inches	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{3}{16}$	$\frac{7}{32}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
$\frac{3}{8}$	\$0.85	\$0.85	\$0.85	.....	.....	.....	.....
$\frac{1}{2}$	.85	.85	.85	\$1.20	\$1.20	.....	.....
$\frac{5}{8}$	.85	.85	.85	1.20	1.20	.....	.....
$\frac{3}{4}$	.85	.85	.85	1.20	1.20	\$1.75	\$2.65
$\frac{7}{8}$	.90	.90	.90	1.25	1.25	1.80	2.70
1	.90	.90	.90	1.30	1.30	1.85	2.75
$1\frac{1}{8}$	.95	.95	.95	1.35	1.35	1.90	2.85
$1\frac{1}{4}$	1.00	1.00	1.00	1.40	1.40	1.95	2.90
$1\frac{3}{8}$	1.05	1.05	1.05	1.45	1.45	2.00	3.00
$1\frac{1}{2}$	1.10	1.10	1.10	1.50	1.50	2.05	3.10
$1\frac{3}{4}$	1.15	1.15	1.15	1.55	1.55	2.15	3.20
2	1.20	1.20	1.20	1.60	1.60	2.30	3.40
$2\frac{1}{4}$	.....	.....	1.25	1.70	1.70	2.40	3.60
$2\frac{1}{2}$	.....	.....	1.30	1.80	1.80	2.50	3.80
$2\frac{3}{4}$	.....	.....	1.40	1.90	1.90	2.60	4.00
3	.....	.....	1.50	2.00	2.00	2.70	4.20
$3\frac{1}{4}$	.....	.....	1.60	2.10	2.10	2.85	4.40
$3\frac{1}{2}$	.....	.....	1.70	2.20	2.20	3.00	4.60
$3\frac{3}{4}$	.....	.....	1.80	2.30	2.30	3.15	4.80
4	.....	.....	1.90	2.40	2.40	3.30	5.00
$4\frac{1}{4}$	.....	.....	2.00	2.50	2.50	3.45	5.20
$4\frac{1}{2}$	.....	.....	2.10	2.60	2.60	3.60	5.40
$4\frac{3}{4}$	.....	.....	2.20	2.70	2.70	3.75	5.60
5	.....	.....	2.30	2.85	2.85	3.90	5.80
$5\frac{1}{4}$	.....	.....	2.40	3.00	3.00	4.10	6.00
$5\frac{1}{2}$	.....	.....	2.50	3.15	3.15	4.30	6.20
$5\frac{3}{4}$	.....	.....	2.60	3.30	3.30	4.50	6.40
6	.....	.....	2.75	3.45	3.45	4.70	6.60

WRITE FOR DISCOUNTS.

No. 2 PLOW BOLTS. ROUND COUNTERSUNK HEAD.



IN STOCK.

LIST PRICE PER 100 BOLTS.

Length Inches	$\frac{5}{16}$.	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$
$1\frac{1}{4}$	\$1.70	\$2.00	\$2.60	\$3.50	\$4.50	\$5.70
$1\frac{1}{2}$	1.80	2.10	2.75	3.70	4.75	6.00
$1\frac{3}{4}$	1.90	2.20	2.90	3.90	5.00	6.30
2	2.00	2.30	3.05	4.10	5.25	6.60
$2\frac{1}{4}$	2.10	2.40	3.20	4.30	5.50	6.90
$2\frac{1}{2}$	2.20	2.50	3.35	4.50	5.75	7.20
$2\frac{3}{4}$	2.30	2.60	3.50	4.70	6.00	7.50
3	2.40	2.70	3.65	4.90	6.25	7.80
$3\frac{1}{4}$	2.50	2.80	3.80	5.10	6.50	8.10
$3\frac{1}{2}$	2.60	2.90	3.95	5.30	6.75	8.40
$3\frac{3}{4}$	2.70	3.00	4.10	5.50	7.00	8.70
4	2.80	3.10	4.25	5.70	7.25	9.00

BOLT ENDS.

**• WITH SQUARE NUTS.
IN STOCK.**



LIST PRICE PER POUND.

Adopted September 20, 1899, to take effect October 1, 1899.

Size of Iron	Length in Inches	Est. Wt. per 100 Bolts	Price per lb.	Size of Iron	Length in Inches	Est. Wt. per 100 Bolts	Price per lb.
$\frac{5}{16}$	6 & 8	15	\$0.20	$1\frac{3}{8}$	15	720	\$0.11
$\frac{3}{8}$	7 & 10	22	.18	$1\frac{1}{2}$	16	940	.11
$\frac{7}{16}$	7 & 10	31	.16	$1\frac{5}{8}$	17	1165	.12
$\frac{1}{2}$	8 & 12	45	.14	$1\frac{3}{4}$	18	1405	.12
$\frac{5}{8}$	9 & 12	90	.12	$1\frac{7}{8}$	19	1800	.12
$\frac{3}{4}$	10 & 12	140	.10	2	20	2045	.12
$\frac{7}{8}$	11 & 12	212	.10	$2\frac{1}{4}$	22	3029	.14
1	12	310	.10	$2\frac{1}{2}$	24	4071	.14
$1\frac{1}{8}$	13	420	.10	$2\frac{3}{4}$	24	4860	.16
$1\frac{1}{4}$	14	550	.11	3	26	6354	.18

With Hexagon Nuts, 10 per cent extra.

Bolt ends ordered shorter than above standard lengths in lots of 100 and over, will be charged at the price per hundred of the bolts of same length, subject to same discount, in smaller lots extra.

WRITE FOR DISCOUNTS.

STUD BOLTS.

**ROUGH STEEL WITH CHAMFERED AND TRIMMED
U. S. STANDARD HEXAGON NUTS.**

Tap End—
Threaded to
make Steam-
tight fit.



Nut End—
Regular
Standard
Thread.

PRICE PER HUNDRED.

Diameter.....	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
No. Threads.....	16	14	13	12, 11	10	9	8
Length over all.							
$1\frac{1}{2}$ inches.....	\$4.00	\$5.10	\$5.50	.....	.....	.....	.....
$1\frac{3}{4}$	4.10	5.25	5.65	.....	.....	.....	.....
2.....	4.20	5.40	5.80	\$ 8.50	\$12.40	.....	.....
$2\frac{1}{4}$	4.30	5.55	5.95	8.75	12.70	.....	.....
$2\frac{1}{2}$	4.40	5.70	6.10	9.00	13.00	\$18.00	.....
$2\frac{3}{4}$	4.50	5.85	6.25	9.25	13.30	18.50	.....
3.....	4.60	6.00	6.40	9.50	13.60	19.00	\$27.80
$3\frac{1}{4}$	4.70	6.15	6.55	9.75	13.90	19.50	28.40
$3\frac{1}{2}$	4.80	6.30	6.70	10.00	14.20	20.00	29.00
$3\frac{3}{4}$	4.90	6.45	6.85	10.25	14.50	20.50	29.60
4.....	5.00	6.60	7.00	10.50	14.80	21.00	30.20
$4\frac{1}{2}$	5.25	6.90	7.30	11.00	15.40	22.00	31.40
5.....	.....	.....	7.60	11.50	16.00	23.00	32.60
$5\frac{1}{2}$.....	.....	.....	8.00	12.00	16.60	24.00	33.80
6.....	.....	.....	8.45	12.50	17.20	25.00	35.00

Studs without nuts will be charged at a reduction of 15 per cent from List Prices. In ordering Studs, please give length of thread wanted on each end, and length of body. We make these Studs of rough steel.

**BELT OR ELEVATOR BOLTS.**

With Countersunk or Oval Heads.

PRICE PER HUNDRED.

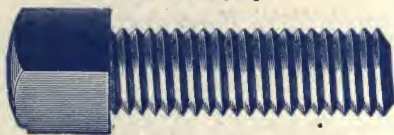
LARGE COUNTERSUNK HEADS.				OVAL HEADS.	
Length Inches	$\frac{3}{16}$ & $\frac{1}{4}$ in. Diam.	$\frac{5}{16}$ in. Diam.	$\frac{3}{8}$ in. Diam.	Length Inches	$\frac{3}{16}$ & $\frac{1}{4}$ in. Diam.
$\frac{3}{4}$	\$2.20	.....	.....	$\frac{3}{4}$	\$1.50
$\frac{1}{8}$	2.30	.....	.....	$\frac{1}{8}$	1.60
1	2.30	\$3.00	\$4.00	1	1.60
$1\frac{1}{4}$	2.40	3.20	4.30	$1\frac{1}{8}$	1.70
$1\frac{1}{2}$	.....	3.40	4.60	$1\frac{1}{4}$	1.80

Unless otherwise specified we shall furnish Belt and Elevator Bolts with Countersunk Heads.

Length of Belt and Elevator Bolts is measured under head.

In ordering please state whether Oval or Countersunk Head Bolts are wanted.

WRITE FOR DISCOUNTS.

IRON SET SCREWS.**IN STOCK.****PRICE PER 100.**

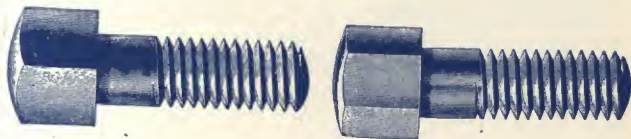
Threads to Inch.	20	18	16	14	12	12	11	10	9	8	7	7
Diam. of Screw.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{1}{2}$	\$1.80	\$2.00	\$2.35	.....	.....	.....	.....	.....	.....	.....	.....	.....
$\frac{5}{8}$	1.90	2.10	2.45	\$2.80	\$3.30	.....	.....	.....	.....	.....	.....	.....
$\frac{3}{4}$	2.00	2.20	2.50	2.90	3.40	\$5.00	\$5.00	.....	.....	.....	.....	.....
$\frac{7}{8}$	2.10	2.30	2.60	3.00	3.60	5.50	5.50	\$.....	.....	.....	.....	.....
1	2.15	2.35	2.65	3.10	3.80	5.75	5.75	10.00	\$.....	.....	.....	.....
$1\frac{1}{4}$	2.30	2.50	2.85	3.50	4.30	6.50	6.50	11.00	15.50	\$.....	.....	.....
$1\frac{1}{2}$	2.50	2.70	3.10	4.00	4.80	7.25	7.25	12.00	16.20	22.00	\$.....	.....
$1\frac{3}{4}$	2.75	3.00	3.50	4.50	5.40	8.00	8.00	12.80	17.70	24.00	41.70	.....
2	3.25	3.50	4.00	5.15	6.00	8.80	8.80	13.60	19.20	26.00	45.00	\$54.00
$2\frac{1}{4}$	3.75	4.00	4.50	5.75	6.75	9.60	9.60	14.50	20.70	28.00	48.30	58.30
$2\frac{1}{2}$	4.25	4.50	5.00	6.35	7.50	10.40	10.40	15.40	22.20	30.00	51.60	62.60
$2\frac{3}{4}$	4.75	5.00	5.50	6.75	8.25	11.20	11.20	16.30	23.70	32.00	54.90	66.90
3	5.25	5.50	6.00	7.20	9.00	12.00	12.00	17.30	25.20	34.00	58.20	71.20
$3\frac{1}{4}$	.....	.....	.....	7.60	9.75	12.75	12.75	18.40	26.70	36.00	61.50	75.50
$3\frac{1}{2}$	.....	.....	.....	8.00	10.50	13.50	13.50	19.50	28.20	38.00	64.80	79.80
$3\frac{3}{4}$	.....	.....	.....	8.50	11.25	14.30	14.30	20.75	29.70	40.00	68.10	84.10
4	.....	.....	.....	9.00	12.00	15.10	15.10	22.00	31.20	42.00	71.40	88.40
$4\frac{1}{4}$	.....	.....	.....	.....	.....	.....	15.90	23.50	32.70	44.00	74.70	92.70
$4\frac{1}{2}$	.....	.....	.....	.....	.....	.....	16.70	25.00	34.20	46.00	78.00	97.00
$4\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	26.50	35.70	48.00	81.30	101.30
5	.....	.....	.....	.....	.....	.....	.....	.....	37.20	50.00	84.60	105.60
Add for each $\frac{1}{4}$ in.	.50	.60	.70	.80	.90	1.10	1.10	1.50	1.70	2.25	3.30	4.30

Length is from under head to extreme point.

WRITE FOR DISCOUNTS.

SQUARE AND HEXAGON HEAD CAP SCREWS.

IN STOCK.

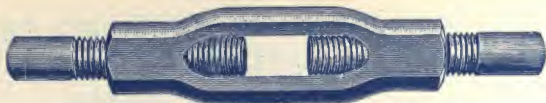


PRICE PER 100.

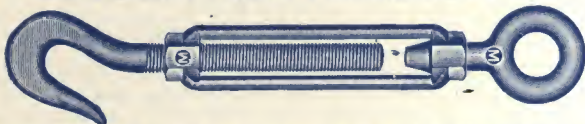
Diam. Head.	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Length Head.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Threads Inch.	20	18	16	14	12	12	11	10	9	8	7	7
Diam. Screw.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{3}{4}$	\$3.00	\$3.25	\$3.75	\$4.50	\$5.70	.....	.....	.....	.....	.....	.....	.....
$\frac{7}{8}$	3.15	3.40	3.90	4.70	5.80	.....	.....	.....	.....	.....	.....	.....
1	3.25	3.50	4.00	4.90	5.90	\$9.25	\$9.25	\$.....	.....	.....	.....	.....
$1\frac{1}{4}$	3.50	3.75	4.25	5.30	6.50	9.50	9.50	12.50	\$.....	.....	.....	.....
$1\frac{1}{2}$	3.75	4.00	4.50	5.70	7.10	10.00	10.00	13.50	18.40	\$.....	.....	.....
$1\frac{3}{4}$	4.00	4.25	4.85	6.10	7.70	10.75	10.75	14.50	19.70	22.75	\$.....	\$.....
2	4.25	4.85	5.20	6.50	8.30	11.50	11.50	15.50	21.00	25.00	34.00	38.50
$2\frac{1}{4}$	4.70	5.35	5.55	7.15	8.90	12.60	12.60	16.50	22.40	27.25	36.75	42.00
$2\frac{1}{2}$	5.25	5.80	6.00	7.50	9.50	13.60	13.60	17.50	23.70	29.50	39.50	45.50
$2\frac{3}{4}$	5.75	6.30	6.65	7.90	10.10	14.40	14.40	19.00	25.00	31.75	42.25	49.00
3	6.25	6.80	7.20	8.40	10.70	15.20	15.20	20.60	26.40	34.00	45.00	52.50
$3\frac{1}{4}$	.....	.....	.....	9.15	11.50	16.00	16.00	22.10	28.20	36.25	47.75	56.00
$3\frac{1}{2}$	.....	.....	.....	9.75	12.30	17.30	17.30	23.70	30.00	38.50	50.50	59.50
$3\frac{3}{4}$	.....	.....	.....	10.50	13.10	18.60	18.60	25.30	31.80	40.75	53.25	63.00
4	.....	.....	.....	11.10	13.90	19.90	19.90	26.90	33.60	43.00	56.00	66.50
$4\frac{1}{4}$	.....	.....	.....	.....	.....	.....	21.20	28.50	35.40	45.25	58.75	70.00
$4\frac{1}{2}$	.....	.....	.....	.....	.....	.....	22.50	30.10	37.20	47.50	61.50	73.50
$4\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	31.70	39.00	49.75	64.25	77.00
5	.....	.....	.....	.....	.....	.....	.....	.....	40.80	52.00	67.00	80.50
Add for each $\frac{1}{4}$	.40	.50	.60	.70	.80	1.30	1.30	1.60	1.80	2.25	2.75	3.50

Length is from under head to extreme point.

WRITE FOR DISCOUNTS.

TURNBUCKLES.**SIZES CARRIED IN STOCK.**

Size Inches	Opening	Length without ends	Length over all	List Price
$\frac{5}{16}$	$5\frac{1}{2}$ in.	$7\frac{1}{4}$ in.	22 in.	\$0.38
$\frac{3}{8}$	"	$7\frac{1}{4}$	22	.40
$\frac{7}{16}$	"	$7\frac{5}{8}$	22	.42
$\frac{1}{2}$	"	$7\frac{7}{8}$	22	.45
$\frac{9}{16}$	"	$7\frac{3}{4}$	22	.48
$\frac{5}{8}$	"	$7\frac{7}{8}$	22	.50
$\frac{3}{4}$	"	$8\frac{1}{4}$	23	.63
$\frac{7}{8}$	"	$8\frac{3}{8}$	24	.75
1	"	9	25	.88
$1\frac{1}{8}$	"	$9\frac{1}{8}$	25	1.00
$1\frac{1}{4}$	"	$9\frac{1}{4}$	26	1.25
$1\frac{3}{8}$	"	$10\frac{1}{8}$	27	1.38
$1\frac{1}{2}$	"	$10\frac{1}{4}$	27	1.50
$1\frac{5}{8}$	"	$10\frac{3}{4}$	28	1.75
$1\frac{3}{4}$	"	$11\frac{1}{4}$	28	2.00
$1\frac{7}{8}$	"	$11\frac{1}{2}$	29	2.25
2	"	12	29	2.65
$2\frac{1}{8}$	"	$12\frac{3}{8}$	29	3.10
$2\frac{1}{4}$	"	$12\frac{1}{2}$	30	3.50
$2\frac{3}{8}$	"	$12\frac{3}{4}$	31	4.00
$2\frac{1}{2}$	"	$13\frac{1}{4}$	32	4.50
$2\frac{5}{8}$	"	$13\frac{3}{8}$	32	5.00
$2\frac{3}{4}$	"	$14\frac{1}{4}$	33	5.50
$2\frac{7}{8}$	"	$14\frac{3}{8}$	33	6.00
3	"	15	34	6.50

WROUGHT IRON TURNBUCKLES.**WITH HOOK AND EYE, TWO EYES OR TWO HOOKS.**

Outside Diameter Screw, Inches	Length in Clear between Heads, Inches	PRICE EACH	
		Black	Galvanized
$\frac{3}{8}$	$3\frac{1}{2}$	\$ 0.80	\$ 0.95
$\frac{1}{4}$	4	.85	1.00
$\frac{5}{8}$	$4\frac{1}{4}$	.90	1.10
$\frac{3}{8}$	$4\frac{1}{2}$	1.10	1.30
$\frac{1}{2}$	5	1.25	1.50
$\frac{5}{8}$	6	1.55	1.80
$\frac{3}{4}$	7	1.85	2.10
$\frac{7}{8}$	8	2.00	2.40
$\frac{1}{2}$	9	2.75	3.50
$\frac{3}{4}$	10	3.50	4.25
$\frac{7}{8}$	11	4.25	5.50
1	12	5.25	7.00
$1\frac{1}{8}$	13	6.25	8.25
$1\frac{1}{4}$	14	7.50	9.50
$1\frac{3}{8}$	15	9.00	11.00
$1\frac{1}{2}$	16	13.00	15.00
$1\frac{5}{8}$	16	17.00	20.00
$1\frac{3}{4}$	16	25.00	28.00
2			

WRITE FOR DISCOUNTS.

TANK LUGS.**TECKTONIUS.****With One Bolt. For Flat Bands.—In Stock.**

For Bands Inches.	Length of Bolts.	Diameter of Bolts.	Weight, lbs.	Price Each.
1	10	$\frac{7}{16}$	$1\frac{1}{2}$	\$0.35
$1\frac{1}{2}$	13	$\frac{1}{2}$	2	.40
$1\frac{3}{4}$	13	$\frac{1}{2}$	$2\frac{3}{4}$	.50
2	14	$\frac{5}{8}$	$3\frac{1}{2}$	.60
$2\frac{1}{2}$	16	$\frac{5}{8}$	5	.80
3	18	$\frac{3}{4}$	$7\frac{1}{4}$	1.00
$3\frac{1}{2}$	18	$\frac{7}{8}$	$9\frac{1}{2}$	1.50

TECKTONIUS.**With Two Bolts. For Flat Bands.—In Stock.**

For Bands Inches.	Length of Bolts.	Diameter of Bolts.	Weight, lbs.	Price Each.
4	18	$\frac{3}{4}$	$13\frac{1}{2}$	\$2.00
$4\frac{1}{2}$	18	$\frac{3}{4}$	$15\frac{3}{4}$	2.50
5	18	$\frac{7}{8}$	.19	3.00
$5\frac{1}{2}$	20	$\frac{7}{8}$	.22	3.25
6	20	$\frac{7}{8}$	.26	3.50

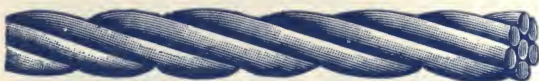
ROUND BAND LUG.**Malleable Iron.—In Stock.**

For Round Bands, Inches.	Price Each.	For Round Bands, Inches.	Price Each.	For Round Bands, Inches.	Price Each.
$\frac{1}{2}$	\$0.10	$\frac{3}{4}$	\$0.16	1	\$0.28
$\frac{5}{8}$	.10	$\frac{7}{8}$	.24		

The $\frac{1}{2}$ inch size is open on top, all others are like the illustrations.**WRITE FOR PRICES.**

GALVANIZED STEEL WIRE STRAND.

For guying Smokestacks, etc.



Revised Standard List, December 19, 1906.

Dia. of Strand	PRICE per 100 feet	Approximate Weight per 1,000 feet, lbs.	Approximate Strength in lbs.	Equivalent in Round Iron	7 Wires
1-8	\$1.00	32	500	.....	No. 20
3-16	1.25	75	1,400	.....	17
1-4	1.75	125	2,300	$\frac{3}{8}$ in.	15
5-16	2.25	210	3,800	$\frac{7}{16}$	12
3-8	2.75	295	5,000	$\frac{1}{2}$	11
1-2	4.50	510	8,500	$\frac{3}{4}$	8

All sizes carried in stock.

Reels contain 4,000 feet or more in length.



Malleable Hooks.



Smokestack Eye Bolts.



Malleable Rings.

LIST PRICES OF FITTINGS.

Size of Strand.....	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Malleable Hooks.....	.05	.07	.08	.15	.20	.28	.66	..	..	..	..	..
Malleable Rings.....	.05	.07	.08	.15	.20	.28	.66	..	..	..	..	..
Eye Bolts.....	..	..	..	..	.05	.06	.12	.14	..	..	..	..
Wire Rope Clips.....	..	..	.25	.25	.25	.30	.35	.40	.45	.50	.50	.60
Galv. Thimbles.....	..	.07	.08	.08	.09	.11	.13	.15	.16	.20	.33	.75

**WIRE ROPE CLIPS.**

All sizes carried in stock.

WRITE FOR DISCOUNTS.

Price List January 1, 1906. Price per 1,000.

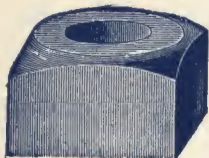
STANDARD FLAT SPRING KEYS.
Price List January 1, 1906. Price per 1,000.
Perfectly uniform in size, and pointed. We make any length and width desired.

Price List January 1, 1906.

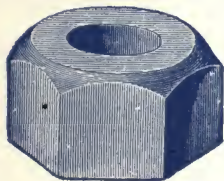
Perfectly uniform in size, and pointed. We make any length and width desired.

UNITED STATES STANDARD LIST HOT PRESSED SQUARE AND HEXAGON NUTS.

IN STOCK.



SQUARE.



HEXAGON.

Amended December 20, 1905, to take effect January 1, 1906.

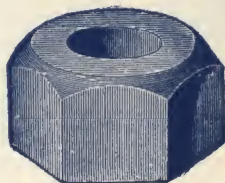
Short Diam.	Thick- ness	Hole	Size of Bolt	Square Blank Per 100 lbs.	Square Tapped Per 100 lbs.	Hexagon Blank Per 100 lbs.	Hexagon Tapped Per 100 lbs.
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{16}$ scant	$\frac{1}{4}$	\$13.00	\$15.00	\$20.00	\$22.50
$\frac{19}{32}$	$\frac{5}{16}$	$\frac{1}{4}$ scant	$\frac{5}{16}$	12.00	13.50	18.00	20.00
$\frac{11}{16}$	$\frac{3}{8}$	$\frac{19}{64}$ scant	$\frac{3}{8}$	10.50	11.60	14.00	15.60
$\frac{25}{32}$	$\frac{7}{16}$	$\frac{11}{32}$	$\frac{7}{16}$	10.00	10.90	13.00	14.30
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{13}{32}$ scant	$\frac{1}{2}$	9.00	9.70	11.20	12.20
$\frac{31}{32}$	$\frac{9}{16}$	$\frac{29}{64}$	$\frac{9}{16}$	9.00	9.60	11.20	12.10
$1\frac{1}{16}$	$\frac{5}{8}$	$\frac{1}{2}$ full	$\frac{5}{8}$	8.70	9.20	10.50	11.20
$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{5}{8}$ scant	$\frac{3}{4}$	8.50	8.90	10.00	10.60
$1\frac{7}{16}$	$\frac{7}{8}$	$\frac{47}{64}$ scant	$\frac{7}{8}$	8.40	8.80	9.90	10.50
$1\frac{5}{8}$	1	$\frac{27}{32}$ scant	1	8.40	8.80	9.90	10.50
$1\frac{1}{2}$	$1\frac{1}{8}$	$\frac{15}{16}$ full	$1\frac{1}{8}$	8.40	8.80	9.90	10.50
2	$1\frac{1}{4}$	$1\frac{1}{16}$ full	$1\frac{1}{4}$	8.40	8.80	9.90	10.50
$2\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{6}{32}$ full	$1\frac{3}{8}$	8.50	9.00	10.00	10.70
$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{9}{32}$ full	$1\frac{1}{2}$	8.80	9.40	10.30	11.10
$2\frac{9}{16}$	$1\frac{5}{8}$	$1\frac{25}{64}$ scant	$1\frac{5}{8}$	9.00	9.70	10.50	11.40
$2\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{2}$ scant	$1\frac{3}{4}$	9.30	10.00	10.80	11.70
$2\frac{15}{16}$	$1\frac{7}{8}$	$1\frac{5}{8}$ scant	$1\frac{7}{8}$	9.50	10.30	11.00	12.00
$3\frac{1}{8}$	2	$1\frac{23}{32}$ scant	2	9.70	10.60	11.20	12.30
$3\frac{5}{16}$	$2\frac{1}{8}$	$1\frac{27}{32}$ scant	$2\frac{1}{8}$	10.00	11.00	11.70	12.90
$3\frac{1}{2}$	$2\frac{1}{4}$	$1\frac{33}{32}$ scant	$2\frac{1}{4}$	10.00	11.10	11.70	13.00
$3\frac{11}{16}$	$2\frac{3}{8}$	$2\frac{1}{16}$	$2\frac{3}{8}$	10.30	11.50	12.20	13.60
$3\frac{7}{8}$	$2\frac{1}{2}$	$2\frac{3}{16}$	$2\frac{1}{2}$	10.50	11.80	12.40	13.90
$4\frac{1}{4}$	$2\frac{3}{4}$	$2\frac{3}{8}$	$2\frac{3}{4}$	11.00	12.40	13.00	14.60
$4\frac{5}{8}$	3	$2\frac{5}{8}$	3	11.50	13.00	13.50	15.20

For less than keg lots (200 lbs.) of a size, add 20 cents per cwt. for 100 lbs. or over, 50 cents per cwt. for less than 100 lbs.

Special nuts of all kinds furnished promptly from factory.

WRITE FOR DISCOUNTS.

MANUFACTURERS' STANDARD HOT-PRESSED NUTS.



Amended December 20, 1905; to take effect January 1, 1906.

SQUARE						HEXAGON					
Short Dia.	Thickness	Hole	Size Bolt	Price per lb. Blank	Price per lb. Tapped	Short Dia.	Thickness	Hole	Size Bolt	Price per lb. Blank	Price per lb. Tapped
1/8	1/4	3/8	1/4	13.0	15.0	1/8	1/4	3/8	1/4	20.0	22.5
3/8	5/8	1/2	5/8	11.5	13.0	3/8	5/8	1/2	5/8	16.0	18.0
1/2	3/4	3/4	3/4	10.0	11.1	1/2	3/4	3/4	3/4	13.0	14.6
3/4	7/8	7/8	7/8	9.2	10.1	3/4	7/8	7/8	7/8	11.4	12.7
1	1	1	1	8.7	9.4	1	1	1	1	10.5	11.5
1 1/8	1 1/8	1 1/8	1 1/8	8.6	9.2	1 1/8	1 1/8	1 1/8	1 1/8	10.4	11.3
1 1/4	1 1/4	1 1/4	1 1/4	8.5	9.0	1 1/4	1 1/4	1 1/4	1 1/4	10.1	10.8
1 1/2	1 1/2	1 1/2	1 1/2	8.4	8.8	1 1/2	1 1/2	1 1/2	1 1/2	9.9	10.5
1 3/4	1 3/4	1 3/4	1 3/4	8.3	8.7	1 3/4	1 3/4	1 3/4	1 3/4	9.8	10.4
2	2	2	2	8.3	8.7	2	2	2	2	9.8	10.4
2 1/4	2 1/4	2 1/4	2 1/4	8.3	8.7	2 1/4	2 1/4	2 1/4	2 1/4	9.8	10.4
2 1/2	2 1/2	2 1/2	2 1/2	8.3	8.7	2 1/2	2 1/2	2 1/2	2 1/2	9.8	10.4
2 3/4	2 3/4	2 3/4	2 3/4	8.5	9.0	2 3/4	2 3/4	2 3/4	2 3/4	10.0	10.7
3	3	3	3	8.7	9.3	3	3	3	3	10.2	11.0
3 1/4	3 1/4	3 1/4	3 1/4	8.9	9.6	3 1/4	3 1/4	3 1/4	3 1/4	10.4	11.3
3 1/2	3 1/2	3 1/2	3 1/2	9.2	9.9	3 1/2	3 1/2	3 1/2	3 1/2	10.7	11.6
3 3/4	3 3/4	3 3/4	3 3/4	9.4	10.2	3 3/4	3 3/4	3 3/4	3 3/4	10.9	11.9
4	4	4	4	9.6	10.5	4	4	4	4	11.1	12.2
4 1/4	4 1/4	4 1/4	4 1/4	9.7	10.7	4 1/4	4 1/4	4 1/4	4 1/4	11.4	12.6
4 1/2	4 1/2	4 1/2	4 1/2	9.9	11.0	4 1/2	4 1/2	4 1/2	4 1/2	11.6	12.9
4 3/4	4 3/4	4 3/4	4 3/4	10.1	11.3	4 3/4	4 3/4	4 3/4	4 3/4	12.0	13.4
5	5	5	5	10.3	11.6	5	5	5	5	12.3	13.8
5 1/2	5 1/2	5 1/2	5 1/2	10.8	12.2	5 1/2	5 1/2	5 1/2	5 1/2	13.0	14.6
6	6	6	6	11.3	12.8	6	6	6	6	13.5	15.2
				12.0	13.6					14.5	16.3
				13.0	14.7					15.5	17.4

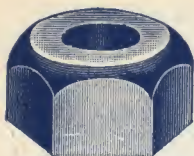
For less than keg lots (200 pounds) of a size, the following extras will be charged, viz.:

At the rate of 20 cents per 100 pounds for 100 pounds or more.

At the rate of 50 cents per 100 pounds for less than 100 pounds.

In ordering nuts other than U. S. Standard sizes, always give short diameter, thickness, and size of hole wanted.

In ordering, always state whether blank or tapped nuts are required.



COLD PUNCHED NUTS. IN STOCK.

Chamfered, Trimmed, Reamed.
United States Standard Stock Sizes.

(Prices are in cents per pound.)

Bolt	Wide	Thick	Hole	SQUARE		HEXAGON	
				Blank	Tapped	Blank	Tapped
$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{13}{16}$	20	22	27	29.5
$\frac{5}{16}$	$\frac{11}{32}$	$\frac{3}{8}$	$\frac{1}{4}$	18	19.5	24	26
$\frac{3}{8}$	$\frac{11}{16}$	$\frac{7}{8}$	$\frac{19}{64}$	14.5	15.6	18.5	20.1
$\frac{7}{16}$	$\frac{25}{32}$	$\frac{7}{16}$	$\frac{11}{32}$	14	14.9	18	19.3
$\frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{13}{32}$	11.3	12	14	15
$\frac{9}{16}$	$\frac{31}{32}$	$\frac{9}{16}$	$\frac{29}{64}$	11.3	11.9	14	14.9
$\frac{5}{8}$	$1\frac{1}{16}$	$\frac{5}{8}$	$\frac{33}{64}$	10	10.5	12.5	13.2
$\frac{3}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	9.7	10.1	11.4	12
$\frac{7}{8}$	$1\frac{7}{8}$	$\frac{7}{8}$	$\frac{47}{64}$	9.6	10	11.1	11.7
1	$1\frac{1}{2}$	1	$\frac{27}{32}$	9.6	10	11.1	11.7
$1\frac{1}{8}$	$1\frac{13}{16}$	$1\frac{1}{8}$	$\frac{15}{16}$	9.6	10	11.1	11.7
$1\frac{1}{4}$	2	$1\frac{1}{4}$	$1\frac{1}{16}$	10.1	10.5	11.5	12.1
$1\frac{3}{8}$	$2\frac{3}{16}$	$1\frac{3}{8}$	$\frac{15}{32}$	10.3	10.8	12	12.7
$1\frac{1}{2}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$\frac{19}{32}$	10.7	11.3	12.6	13.4
$1\frac{3}{4}$	$2\frac{9}{16}$	$1\frac{3}{4}$	$\frac{13}{8}$	11.1	11.8	13.2	14.1
$1\frac{7}{8}$	$2\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	11.5	12.2	14	14.9
2	$2\frac{15}{16}$	2	$1\frac{5}{8}$	12	12.8	14.5	15.5
$2\frac{1}{8}$	$3\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{23}{32}$	12	12.9	14.5	15.6
$2\frac{3}{8}$	$3\frac{5}{16}$	$2\frac{3}{8}$	$1\frac{13}{16}$	12.5	13.5	15	16.2
$2\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{15}{16}$	12.5	13.6	15	16.3

All sizes carried in stock for immediate shipment.

All Nuts packed in 200 lb. Kegs.

11-16 same price as $\frac{3}{4}$. Not kept in stock.

Plain, Check and Jam Nuts—U. S. Standard sizes shipped promptly from mill.

MILL

Less than 50 lbs. of a size $\frac{1}{2}$ ct. per lb. net extra.

EXTRAS:

51 to 200 lbs. of a size 20 cts. cwt. net extra.

Special Holes and Special Threads: Extra.

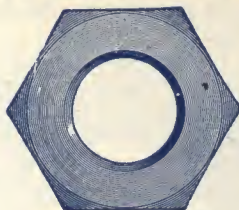
IMPORTANT:

{ When ordering blank Nuts, state whether for U. S. or V taps. Unless otherwise ordered, U. S. Standard threads will be furnished. U. S. Standard Plain Nuts carried in stock. Prices on application.

WRITE FOR PRICES.

HEXAGON NUTS.

**FINISHED,
CASE-HARDENED
AND
SEMI-FINISHED.**



IN STOCK.

SEMI-FINISHED.

Revised List, adopted February 21, 1906.

Size of Bolt.	Width	Thick-ness.	Threads to Inch.	Finished Case-Hardened Nuts Price each.	Finished Case-Hardened with Double Chamfer Price each.	Semi-Finished Nuts Price each.	Semi-Finished with Double Chamfer Price each.
$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	20	\$ 0.06	\$ 0.06 $\frac{1}{2}$	\$0.02	\$0.02 $\frac{1}{2}$
$\frac{5}{16}$	$\frac{3}{8}$	$\frac{5}{16}$	18	.07	.07 $\frac{1}{2}$	.02 $\frac{1}{2}$	.02 $\frac{3}{4}$
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	16	.08	.08 $\frac{3}{4}$	.03 $\frac{1}{4}$	.04
$\frac{7}{16}$	$\frac{5}{8}$	$\frac{7}{16}$	14	.09	.10	.03 $\frac{3}{4}$	.04 $\frac{3}{4}$
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	12 or 13	.10	.11	.04 $\frac{1}{2}$	.05 $\frac{1}{2}$
$\frac{9}{16}$	$\frac{7}{8}$	$\frac{9}{16}$	12	.12	.13	.05 $\frac{1}{2}$	.06 $\frac{1}{2}$
$\frac{5}{8}$	1	$\frac{5}{8}$	11	.16	17 $\frac{1}{2}$	.06 $\frac{1}{2}$	.07 $\frac{1}{2}$
$\frac{11}{16}$	1 $\frac{1}{8}$	$\frac{11}{16}$	11	.22	.24	.08 $\frac{1}{2}$	.10 $\frac{1}{2}$
$\frac{3}{4}$	1 $\frac{1}{4}$	$\frac{3}{4}$	10	.22	.24	.08 $\frac{1}{2}$	.10 $\frac{1}{2}$
$\frac{7}{8}$	1 $\frac{3}{8}$	$\frac{7}{8}$	9	.27	29 $\frac{1}{2}$	.12	14 $\frac{1}{2}$
1	1 $\frac{5}{8}$	1	8	.38	41 $\frac{1}{2}$	16 $\frac{1}{2}$	20
1 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{8}$	7	.50	54 $\frac{1}{2}$	.22	26 $\frac{1}{2}$
1 $\frac{1}{4}$	2	1 $\frac{1}{4}$	7	.66	.72	.30	.36
1 $\frac{3}{8}$	2 $\frac{3}{8}$	1 $\frac{3}{8}$	6	.90	.97	.45	.53
1 $\frac{1}{2}$	2 $\frac{3}{4}$	1 $\frac{1}{2}$	6	1.20	1.30	.62	.71
1 $\frac{5}{8}$	2 $\frac{7}{8}$	1 $\frac{5}{8}$	5 $\frac{1}{2}$	1.45	1.58	.82	.94
1 $\frac{3}{4}$	3	1 $\frac{3}{4}$	5	1.75	1.90	1.20	1.34
1 $\frac{7}{8}$	3 $\frac{1}{8}$	1 $\frac{7}{8}$	5	2.50	2.70	1.45	1.65
2	3 $\frac{1}{2}$	2	4 $\frac{1}{2}$	3.25	3.50	1.80	2.05
2 $\frac{1}{4}$	3 $\frac{3}{4}$	2 $\frac{1}{4}$	4 $\frac{1}{2}$	5.50	6.00	2.75	3.10
2 $\frac{1}{2}$	4	2 $\frac{1}{2}$	4	8.50	9.50	4.00	4.40
2 $\frac{3}{4}$	4 $\frac{1}{4}$	2 $\frac{3}{4}$	4	12.00	13.50	5.50	6.10
3	4 $\frac{5}{8}$	3	3 $\frac{1}{2}$	18.00	20.00	8.50	9.50

FINISHED NUTS.

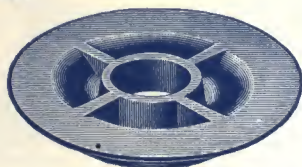
Use regular list for Nuts thinner or smaller than standard. Use regular list for Finished Nuts, not case-hardened. Polished Nuts, after case-hardening, add 30% to the list. Finished Case-Hardened Hexagon Nuts, where thickness is $\frac{1}{4}$ times diameter of bolt, add 25% to the list. Where the thickness is $\frac{1}{2}$ times diameter, add 50% to the list. Where the thickness is $\frac{3}{4}$ times diameter, add 75% to the list. Where thickness is double the diameter, add 100% to the list.

SEMI-FINISHED NUTS.

Semi-Finished Nuts, case-hardened, add 20% to the list, and use the Double Chamfered list, if rounded on top. Use regular list for Nuts thinner than standard.

WRITE FOR DISCOUNTS.

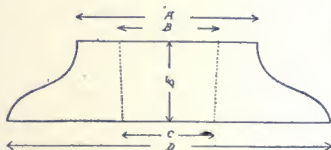
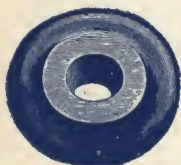
MALLEABLE IRON WASHERS. IN STOCK.



400 per cent stronger, and weight one-third of cast washers, making a large saving in freight rate.

Bolt Inches.	Dia. Inches.	Thick. Inches.	Est. Wt. Ounces.	Bolt Inches.	Dia. Inches.	Thick. Inches.	Est. Wt. Ounces.
$\frac{1}{2}$	$2\frac{1}{2}$	$\frac{5}{16}$	$2\frac{1}{3}$	$1\frac{1}{8}$	$4\frac{1}{2}$	$\frac{9}{16}$	14
$\frac{5}{8}$	3	$\frac{7}{16}$	$5\frac{1}{3}$	$1\frac{1}{4}$	5	$\frac{3}{4}$	24
$\frac{3}{4}$	3	$\frac{1}{2}$	$5\frac{1}{3}$	$1\frac{1}{2}$	6	$\frac{3}{4}$	30
$\frac{7}{8}$	$3\frac{1}{2}$	$\frac{9}{16}$	8	$1\frac{3}{4}$	6	$\frac{3}{4}$	33
1	4	$\frac{9}{16}$	11	2	6	1	67

STANDARD O. G. CAST WASHERS.



SIZES IN STOCK.

Bolt Inches.	A	B	C	D	E	Weight.
$\frac{3}{8}$	1	$\frac{7}{16}$	$\frac{1}{2}$	$1\frac{1}{4}$	$\frac{7}{16}$	$2\frac{1}{2}$ oz.
$\frac{1}{2}$	$1\frac{5}{8}$	$\frac{11}{16}$	$\frac{5}{8}$	$2\frac{1}{2}$	$\frac{1}{2}$	7 oz.
$\frac{5}{8}$	2	$\frac{13}{16}$	$\frac{3}{4}$	3	$\frac{5}{8}$	12 oz.
$\frac{3}{4}$	2	$\frac{15}{16}$	$\frac{7}{8}$	3	$\frac{3}{4}$	1 lb.
$\frac{7}{8}$	$2\frac{1}{2}$	$1\frac{1}{16}$	1	$3\frac{1}{2}$	$\frac{7}{8}$	1 lb. 6 oz.
1	$2\frac{1}{2}$	$1\frac{3}{16}$	$1\frac{1}{8}$	4	1	2 lb.
$1\frac{1}{8}$	$2\frac{7}{8}$	$1\frac{5}{16}$	$1\frac{1}{4}$	4	$1\frac{1}{8}$	2 lb. 6 oz.
$1\frac{1}{4}$	$3\frac{1}{2}$	$1\frac{7}{16}$	$1\frac{3}{8}$	$5\frac{1}{4}$	$1\frac{1}{4}$	4 lb. 4 oz.
$1\frac{3}{8}$	$3\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{1}{2}$	$5\frac{1}{4}$	$1\frac{1}{4}$	4 lb. 4 oz.
$1\frac{1}{2}$	$3\frac{3}{4}$	$1\frac{11}{16}$	$1\frac{5}{8}$	6	$1\frac{1}{2}$	6 lb.

Special Washers of every description made to order.

WRITE FOR PRICES.

STANDARD LIST OF WROUGHT WASHERS. IN STOCK.

U. S.
Standard
Sizes



In
200 Pound
Kegs

Adopted January 20, 1910.

Diameter	Size of Hole	Thickness Wire Gauge	Size of Bolt	Prices per lb., Cents	Number in 100 lbs.
$\frac{9}{16}$	$\frac{1}{4}$	18	$\frac{3}{16}$	14.00	39400
$\frac{3}{4}$	$\frac{5}{16}$	16	$\frac{1}{4}$	12.20	15600
$\frac{7}{8}$	$\frac{3}{8}$	16	$\frac{5}{16}$	11.40	11250
1	$\frac{7}{16}$	14	$\frac{3}{8}$	10.50	6800
$1\frac{1}{4}$	$\frac{1}{2}$	14	$\frac{7}{16}$	9.80	4300
$1\frac{3}{8}$	$\frac{9}{16}$	12	$\frac{1}{2}$	9.40	2600
$1\frac{1}{2}$	$\frac{5}{8}$	12	$\frac{9}{16}$	9.30	2250
$1\frac{3}{4}$	$\frac{11}{16}$	10	$\frac{5}{8}$	9.20	1300
2	$\frac{13}{16}$	9	$\frac{3}{4}$	9.10	900
$2\frac{1}{4}$	$\frac{15}{16}$	8	$\frac{7}{8}$	9.00	782
$2\frac{1}{2}$	$1\frac{1}{16}$	8	1	9.00	568
$2\frac{3}{4}$	$1\frac{1}{4}$	8	$1\frac{1}{8}$	9.00	473
3	$1\frac{3}{8}$	8	$1\frac{1}{4}$	9.20	364
$3\frac{1}{4}$	$1\frac{1}{2}$	7	$1\frac{3}{8}$	9.20	275
$3\frac{1}{2}$	$1\frac{5}{8}$	7	$1\frac{1}{2}$	9.20	256
$3\frac{3}{4}$	$1\frac{3}{4}$	7	$1\frac{5}{8}$	9.50	220
4	$1\frac{7}{8}$	7	$1\frac{3}{4}$	9.50	197
$4\frac{1}{4}$	2	7	$1\frac{7}{8}$	9.50	174
$4\frac{1}{2}$	$2\frac{1}{8}$	7	2	9.50	160

Add \$0.10 cwt. for 100 pound kegs.
 " .20 " " 50 to 100 pound boxes.
 " .30 " " 25 to 50 " "
 " .50 " " 5 " "
 " 1.00 " " 1 " "

Washers of irregular sizes, made to order, will be charged extra.

COMMON WIRE NAILS.



IN STOCK.

Size	Length and Gauge	Approx. No. to Lb.	Advance over Base Price	Size	Length and Gauge	Approx. No. to Lb.	Advance over Base Price
2d	1 inch No. 15	876	\$0.70	10d	3 inch No. 9	69	\$0.05
3d	$1\frac{1}{4}$ " " 14	568	.45	12d	$3\frac{1}{4}$ " " 9	63	.05
4d	$1\frac{1}{2}$ " " $12\frac{1}{2}$	316	.30	16d	$3\frac{1}{2}$ " " 8	49	.05
5d	$1\frac{3}{4}$ " " $12\frac{1}{2}$	271	.30	20d	4 " " 6	31	Base
6d	2 " " $11\frac{1}{2}$	181	.20	30d	$4\frac{1}{2}$ " " 5	24	Base
7d	$2\frac{1}{4}$ " " $11\frac{1}{2}$	161	.20	40d	5 " " 4	18	Base
8d	$2\frac{1}{2}$ " " $10\frac{1}{4}$	106	.10	50d	$5\frac{1}{2}$ " " 3	14	Base
9d	$2\frac{3}{4}$ " " $10\frac{1}{4}$	96	.10	60d	6 " " 2	11	Base

For Standard Nail Card see page 246.

WRITE FOR PRICES.

BOAT SPIKES.

Advance over
base price
per 100 lbs.

$\frac{3}{4}$ inch Square, 12 to 24 in length.....						\$0.05
$\frac{5}{8}$ " 8 to 16 " .....						.05
$\frac{1}{2}$ " 6 to 16 " .....						.05
$\frac{7}{16}$ " 6 to 12 " .....						.10
$\frac{3}{8}$ " 4 to 12 " .....						.20
$\frac{5}{16}$ " 4 to 8 " .....						.35
$\frac{1}{4}$ " 4 to 8 " .....						.65
$\frac{1}{4}$ " 3 to $3\frac{1}{2}$ " .....						.90

$\frac{3}{8}$ and $\frac{5}{16}$ shorter than 4 in. $\frac{1}{4}$ cent extra.

DRIFT BOLTS.

Furnished to order only.

ROUND.

Size, inches... $\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Per lb., Plain..\$....	\$....	\$....	\$....	\$....	\$....
Extra for Pointing or Heading.....					per lb., .20
Extra for Pointing and Heading.....					" .40
Order by Number.					

SQUARE.

Size, inches... $\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Per lb., Plain..\$....	\$....	\$....	\$....	\$....	\$....
Extra for Pointing or Heading.....					per lb., .20
Extra for Pointing and Heading.....					" .40
Order by Number.					

**No. 1. PLAIN ROUND.****No. 2. POINTED ROUND.****No. 5. PLAIN SQUARE.****No. 6. POINTED SQUARE.**

WRITE FOR PRICES.

**RAILROAD TRACK SPIKES.****IN STOCK—IN 200-LB. KEGS.**

Size.	For Rails.	No. in 200 lbs.	List Price Extras.
$\frac{5}{16} \times 2\frac{1}{2}$	8 to 12 lbs.	2230	\$0.45
$\frac{3}{8} \times 2\frac{1}{2}$	12 to 16 lbs.	1650	.30
$\frac{3}{8} \times 3$	16 to 20 lbs.	1380	.20
$\frac{1}{2} \times 4$	24 to 35 lbs.	605	.05
$\frac{1}{2} \times 4\frac{1}{2}$	28 to 35 lbs.	518	.05
$\frac{9}{16} \times 5\frac{1}{2}$	45 to 100 lbs.	360	Base

Other sizes shipped promptly from mills.

STANDARD LIST—RAILROAD SPIKES.

Size measured under head.	Average No. per keg of 200 lbs.	Ties 2 feet between center, 4 spikes per tie, makes per mile.	Rail used, weight per yard.	Extras per lb.
$5\frac{1}{2} \times \frac{9}{16}$	360	5920 lbs.—29 $\frac{1}{8}$ Kegs.	45 to 100	Base
$5 \times \frac{1}{2}$	405	5230 lbs.—26 $\frac{1}{8}$ Kegs.	40 to 56	Base
$4\frac{1}{2} \times \frac{1}{2}$	460	4606 lbs.—23 Kegs.	35 to 40	Base
$5 \times \frac{1}{2}$	475	4460 lbs.—22 $\frac{3}{8}$ Kegs.		\$0.05
$4\frac{1}{2} \times \frac{1}{2}$	518	4080 lbs.—20 $\frac{3}{8}$ Kegs.	28 to 35	.05
$4 \times \frac{1}{2}$	605	3515 lbs.—17 $\frac{1}{2}$ Kegs.	24 to 35	.05
$3\frac{1}{2} \times \frac{1}{2}$	670	3180 lbs.—15 $\frac{7}{8}$ Kegs.	20 to 30	.05
$4\frac{1}{2} \times \frac{1}{2}$	690	3090 lbs.—15 $\frac{1}{2}$ Kegs.		.10
$4 \times \frac{1}{2}$	780	2730 lbs.—13 $\frac{3}{8}$ Kegs.	16 to 25	.10
$3\frac{1}{2} \times \frac{1}{2}$	890	2377 lbs.—12 Kegs.		.10
$4\frac{1}{2} \times \frac{3}{8}$	780	2730 lbs.—13 $\frac{3}{8}$ Kegs.	16 to 25	.20
$4 \times \frac{3}{8}$	1025	2044 lbs.—10 $\frac{1}{2}$ Kegs.		.20
$3\frac{1}{2} \times \frac{3}{8}$	1250	1740 lbs.—8 $\frac{1}{2}$ Kegs.	16 to 20	.20
$3 \times \frac{3}{8}$	1380	1592 lbs.—8 Kegs.		.20
$2\frac{1}{2} \times \frac{3}{8}$	1650	1280 lbs.—6 $\frac{3}{4}$ Kegs.	12 to 16	.30
$3 \times \frac{1}{2}$	1880	1152 lbs.—5 $\frac{3}{4}$ Kegs.		.45
$2\frac{1}{2} \times \frac{1}{2}$	2230	948 lbs.—4 $\frac{3}{4}$ Kegs.	8 to 12	.45

Reverse points, $\frac{1}{4}$ cent extra (smallest $3 \times \frac{3}{8}$).**TRACK BOLTS.**

Shipped promptly from mills.



Size of Bolts, Inches.	For Rails, Pounds.	Square Nut.		Hexagon Nut.	
		Number in 200 lbs.	Extra Price per 100 lbs.	Number in 200 lbs.	Extra Price per 100 lbs.
$\frac{3}{8} \times 1\frac{1}{2}$	8 to 10	1800	\$3.15	1900	\$3.70
$\frac{1}{2} \times 1\frac{3}{4}$	12 to 16	800	1.55	850	1.90
$\frac{1}{2} \times 2$	20	775	1.35	820	1.70
$\frac{1}{2} \times 2\frac{1}{4}$	25	750	1.20	800	1.55
$\frac{5}{8} \times 2\frac{1}{2}$	30 to 35	445	.60	465	.85
$\frac{3}{4} \times 3$	40 to 45	268	.15	283	.35
$\frac{3}{4} \times 3\frac{1}{4}$	50	250	.05	266	.25
$\frac{3}{4} \times 3\frac{1}{2}$	55	240	Base	260	.15
$\frac{3}{4} \times 3\frac{3}{4}$	60 to 70	239	Base	254	.15
$\frac{3}{4} \times 4$	75 to 80	231	Base	240	.15
$\frac{3}{4} \times 4\frac{1}{4}$	85 to 90	224	Base	230	.15
$\frac{7}{8} \times 4\frac{1}{2}$	96 to 100	155	Base	163	.15

WRITE FOR PRICES.

SOFT STEEL COIL CHAINS, SHORT LINK. IN STOCK.



STRAIGHT LINK.



TWIST LINK.

Proof tests adopted November 11, 1896.

Size Inches	Proof lbs.	BB Crane lbs.	BBB Crane lbs.	Average Weight Per Foot lbs.
$\frac{3}{16}$	700	770	900	.5
$\frac{1}{4}$	1,200	1,320	1,500	.9
$\frac{5}{16}$	2,500	2,750	3,200	1.22
$\frac{3}{8}$	3,500	3,850	4,425	1.6
$\frac{7}{16}$	4,800	5,280	6,100	2.0
$\frac{1}{2}$	6,200	6,820	7,850	2.5
$\frac{9}{16}$	7,800	8,580	9,870	3.2
$\frac{5}{8}$	9,600	10,560	12,150	4.2
$\frac{11}{16}$	11,500	12,650	14,550	5.0
$\frac{3}{4}$	13,800	15,180	17,475	5.9
$\frac{13}{16}$	16,200	17,820	20,500	6.7
$\frac{7}{8}$	18,800	20,680	23,780	7.9
$\frac{15}{16}$	21,500	23,650	27,200	9.0
1	24,600	27,100	31,200	10.2
$1\frac{1}{16}$	26,300	28,930	33,300	11.4
$1\frac{1}{8}$	29,500	32,450	37,300	12.7
$1\frac{3}{16}$	33,000	36,300	41,750	14.2
$1\frac{1}{4}$	36,500	40,150	46,175	15.8
$1\frac{5}{16}$	40,000	44,000	50,600	17.2
$1\frac{3}{8}$	44,000	48,400	55,660	18.8
$1\frac{7}{16}$	48,200	53,000	60,950	20.4
$1\frac{1}{2}$	52,500	57,750	66,400	22.2
$1\frac{9}{16}$	57,000	62,700	72,100	24.0
$1\frac{5}{8}$	61,700	67,870	78,050	26.7
$1\frac{11}{16}$	66,500	73,150	84,120	28.5
$1\frac{3}{4}$	71,600	78,760	90,575	31.0

Safe working load should be about one-half of proof test.

The breaking strain is about double the proof test.

Prices quoted on application.



BRIGHT GERMAN COIL. STRAIGHT OR TWIST LINK.

Size.....	3.0	2.0	1.0	1	2	3
Per 100 feet	\$11.00	\$10.00	\$8.80	\$7.80	\$7.20	\$6.80

WRITE FOR PRICES AND DISCOUNTS.

SWEDISH STEEL CHAIN.



ALL CHAIN HAND FORGED.

This chain is made in Sweden, by a new process, from the highest grade of metal. Swedish Iron Chain has long been considered a most satisfactory and economical chain. On account of its ductility it will not snap suddenly, but the links will be drawn out straight before breaking. It is non-crystalline, and will wear to the last shred. Swedish Steel Chain not only possesses this same quality, but is about 40 per cent. stronger than the Swedish Iron Chain. It is most suitable for use in logging, handling steel beams and castings, and on all occasions where an extra strong and reliable chain is required.

In the Swedish chain the breaking point is not reached until after the chain has stood a strain of more than double the intensity which is certified on each test. After test, every link is examined by personal inspection, and any imperfect link is replaced.

Steel chain, in sizes marked * carried in Chicago stock. Other sizes and all sizes Iron chain, shipped promptly from New York stock.

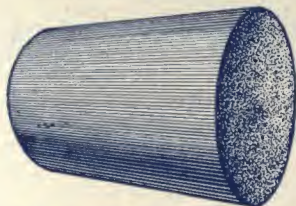
Inches	Milli- meters	Strength Test in lbs.		Inches	Milli- meters	Strength Test in lbs.	
		Iron	Steel			Iron	Steel
* $\frac{3}{16}$	4.5	981	1,460	$1\frac{1}{8}$	28	37,154	54,309
$\frac{7}{32}$	5	1,113	1,731	$1\frac{3}{16}$	29.5	42,204	60,282
* $\frac{1}{4}$	6	1,746	2,492	$1\frac{1}{2}$	31	46,592	66,569
$\frac{9}{32}$	6.5	2,046	2,922	$1\frac{5}{16}$	32.5	51,222	73,168
* $\frac{5}{16}$	7.5	2,491	3,892	$1\frac{3}{4}$	34	56,051	80,079
$\frac{11}{32}$	8.5	3,502	4,994	$1\frac{7}{16}$	35.5	61,100	87,300
* $\frac{3}{8}$	9	3,925	5,612	$1\frac{1}{2}$	37	66,393	94,833
$\frac{13}{32}$	10	4,851	6,924	$1\frac{9}{16}$	38.5	71,883	.....
$\frac{7}{16}$	11	5,865	8,379	$1\frac{11}{16}$	40	75,819	.....
* $\frac{1}{2}$	12.5	7,572	10,824	$1\frac{13}{16}$	42	85,532	.....
$\frac{9}{16}$	14	9,504	13,580	$1\frac{3}{4}$	43	89,655	.....
* $\frac{5}{8}$	15.5	11,642	16,643	$1\frac{7}{8}$	45	98,189	.....
$\frac{11}{16}$	17	14,010	20,020	$1\frac{15}{16}$	46.5	104,848	.....
$\frac{3}{4}$	18	15,700	22,447	$1\frac{1}{2}$	48	111,727	.....
$\frac{13}{16}$	18.5	16,595	23,708	2	49.5	118,805	.....
$\frac{7}{8}$	20	19,395	27,708	$2\frac{1}{16}$	51	126,126	.....
* 1	21.5	22,447	32,021	$2\frac{1}{8}$	52.5	133,645	.....
$1\frac{1}{16}$	23	25,651	36,644	$2\frac{3}{16}$	54	141,318	.....
* $1\frac{1}{8}$	24.5	28,445	41,582	$2\frac{1}{2}$	55.5	149,279	.....
$1\frac{3}{8}$	26.5	34,052	48,647	$2\frac{5}{8}$	57	157,459	.....

The above figures give the strengths guaranteed by the Swedish mill.

The Breaking Strain is DOUBLE the above figures.

WRITE FOR PRICES.

GREY IRON FLUE PLUGS. IN STOCK.



To be used in plugging flues in an emergency.

For Flues	List Price, Each
2 inches.....	\$0.40
2½ inches.....	.50
3 inches.....	.60
3½ inches.....	.80
4 inches.....	1.00

FUSIBLE PLUGS. IN STOCK.



Size.....Inches	¼	¾	1	1¼	1½	2
Price .....Each	\$0.60	\$0.75	\$1.00	\$1.50	\$2.00	\$3.00

These Plugs are filled with Banca Tin and stamped according to the requirements of the Marine Service of the United States Government.

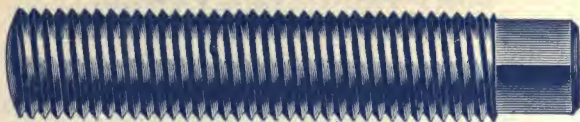
GENUINE SOAPSTONE CRAYONS.



PRICE LIST.

Size and Description of Crayons. Sizes carried in stock.	List Price Per Gross.
¼ inch Square Crayons.....	\$2 00
¼ inch Round Crayons.....	2 50
Metal Workers' Crayons, 5x½x⅜.....	3.00

WRITE FOR DISCOUNTS.

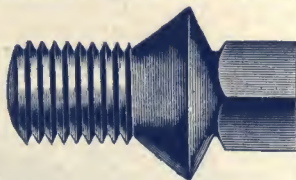
BOILER STAYBOLTS.

We carry all sizes
in stock
in 18 & 36-inch lengths.

Diameter of Stay Bolts in Inches.

	1-2	5-8	3-4	7-8	15-16	1	11-8	11-4
List per Foot.	36 cts.	40 cts.	60 cts.	80 cts.	\$1.00	\$1.00	\$1.30	\$1.50

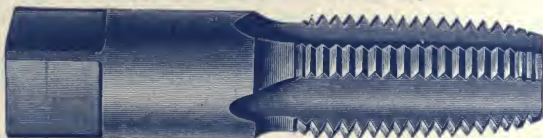
Heads of Stay Bolts are 1 in. long, and are figured in length of bolt.
Stay Bolts shorter than 12 in. long will be charged special prices.

BOILER PATCH BOLTS.

THREADED—12 threads to an inch.
SIZES CARRIED IN STOCK IN CHICAGO.

Diameter in Inches	Length in Inches	List Price per 100 Bolts	Diameter in Inches	Length in Inches	List Price per 100 Bolts
$\frac{1}{2}$	$\frac{3}{4}$	\$3.75	$\frac{3}{4}$	1	\$ 6.50
	1	4.25		$1\frac{1}{4}$	7.25
	$1\frac{1}{4}$	4.75		$1\frac{1}{2}$	8.25
	$1\frac{1}{2}$	5.25	$\frac{7}{8}$	1	9.50
	$\frac{3}{4}$	4.25		$1\frac{1}{4}$	10.25
$\frac{5}{8}$	1	4.80		$1\frac{1}{2}$	11.25
	$1\frac{1}{4}$	5.50	1	$1\frac{3}{4}$	14.75
	$1\frac{1}{2}$	6.50		$1\frac{1}{2}$	16.25

Any diameter or length, also Blank Patch Bolts, shipped promptly from mill.
The length of a Patch Bolt is the distance from top of countersink to end of bolt. Heads countersunk at an angle of 45 degrees.

PATCH BOLT TAPS.

Sizes carried in stock all 12 thread.

Dia. in Inches.	PRICE.	Dia. in Inches	PRICE.	Dia. in Inches.	PRICE.	Dia. in Inches	PRICE.
1-2	\$.70	11-16	\$1.05	7-8	\$1.60	1 1-16	\$2.15
9-16	.80	3-4	1.20	15-16	1.80	1 1-8	2.25
5-8	.90	13-16	1.40	1	2.00	1 1-4	2.60

These Taps are made especially for Boilermakers and are slightly tapered in order to make steam-tight joint.

WRITE FOR DISCOUNTS.

STAYBOLT TAPS.

Sizes Carried in Stock—12 Thread.

Dia. in.	Length in.	List Price.	Dia. in.	Length in.	List Price
$\frac{3}{8}$	16	\$ 5.60	$\frac{1}{8}$	24	\$10.20
$\frac{3}{8}$	18	7.20	$\frac{1}{8}$	16	6.60
$\frac{3}{8}$	21	8.00	$\frac{1}{8}$	18	8.50
$\frac{3}{8}$	24	8.80	$\frac{1}{8}$	21	9.35
$\frac{7}{8}$	16	5.60	$\frac{1}{8}$	24	10.20
$\frac{7}{8}$	18	7.20	$\frac{1}{8}$	36	16.50
$\frac{7}{8}$	21	8.00	$1\frac{1}{8}$	18	9.50
$\frac{7}{8}$	24	8.80	$1\frac{1}{8}$	21	10.35
$\frac{7}{8}$	36	15.00	$1\frac{1}{8}$	24	11.20
$1\frac{1}{8}$	18	8.50	$1\frac{1}{8}$	24	12.75
$1\frac{1}{8}$	21	9.35	$1\frac{1}{8}$	36	19.50

N. B.—All stock taps are divided into equal thirds; that is $\frac{1}{3}$ shank, $\frac{1}{3}$ thread and $\frac{1}{3}$ reamer.

Any size shipped promptly from factory.

PRICE LIST.

Diameter inches.	Length in inches.									
	16	18	21	24	27	30	33	36	39	42
$\frac{3}{8}$ — $1\frac{1}{8}$	\$5.60	\$7.20	\$8.00	\$8.80	\$10.90	\$13.00	\$14.00	\$15.00	\$16.50	\$18.00
$\frac{1}{8}$ —1	6.60	8.50	9.35	10.20	12.25	14.25	15.40	16.50	18.15	19.75
$1\frac{1}{8}$ — $1\frac{1}{2}$	7.60	9.50	10.35	11.20	13.25	15.25	16.40	17.50	20.00	22.00
$1\frac{1}{8}$ — $1\frac{3}{4}$	9.00	10.50	12.00	12.75	14.75	16.50	18.00	19.50	22.00	24.00
$1\frac{1}{8}$ — $1\frac{3}{4}$	11.00	12.50	14.00	15.00	17.00	18.50	20.00	21.50	24.00	26.00
$1\frac{1}{8}$ — $1\frac{3}{4}$	13.00	14.50	16.00	17.00	19.00	20.00	22.00	23.50	26.00	28.00

When ordering Taps, state diameter and number of threads per inch, and also lengths of parts at A, B, C, D and E.

SPINDLE STAY-BOLT TAPS.

In Stock.

Used for retapping stay-bolt holes from the inside of fire-box of locomotives.

These taps will be furnished with "V" form of thread, 12 to the inch, unless otherwise specified.

Other sizes than those named below will be furnished to order at special prices.

Dia. of Tap in.	Length of Fluted Thread in.	Length of Unfluted Thread in.	Total Length in.	Diameter of Spindle inches.	Length of Spindle inches.	Price Each.
$\frac{3}{8}$	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	$\frac{3}{8}$	11	\$ 8.00
$\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	$\frac{1}{2}$	11	8.50
$\frac{5}{8}$	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	$\frac{5}{8}$	11	9.00
$\frac{3}{4}$	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	$\frac{3}{4}$	11	9.50
1	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	1	11	10.00
$1\frac{1}{8}$	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	$1\frac{1}{8}$	11	10.50
$1\frac{1}{4}$	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	$1\frac{1}{4}$	11	11.00
$1\frac{3}{8}$	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	$1\frac{3}{8}$	11	11.50
$1\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{1}{4}$	7%	$1\frac{1}{2}$	11	12.00

WRITE FOR DISCOUNTS.

SCULLY WELDLESS STEEL BOILER BRACE.



LIGHTEST. STRONGEST. CHEAPEST.

These braces are forged from open-hearth steel of 60,000 lbs. tensile strength.

The ends are upset and formed in a heavy forging machine WITHOUT WELDS.

The sizes of both ends are so designed that the area (after punching out holes), is practically the same at all points.

Brace is easily fitted and will gather little scale.

TABLE OF STEEL BOILER BRACES.

Showing number generally placed in each head of Standard Tubular Boilers above the tubes.

Diam. of Shell.	No. of Tubes in Boiler.	Length and Number of Braces.					
		42	48	54	60	72	Total
36 inches	26 3 in. Dia.	4	2	..	..	..	6
	26 3½	4	2	..	..	..	6
42 inches	30 3½	4	2	..	..	..	6
	34 3½	6	2	..	..	..	8
44 inches	30 4	6	2	..	..	..	8
	28 3½	5	3	..	1	..	9
48 inches	26 4	5	4	..	..	..	9
	44 3½	..	6	..	4	2	12
54 inches	36 4	..	5	..	3	2	10
	54 3½	..	7	..	5	2	14
60 inches	44 4	..	7	..	5	3	15
	54 4	..	7	..	4	2	13
66 inches	66 3½	..	8	..	6	3	17
	54 4	..	8	..	5	2	15
72 inches	86 3½	..	10	7	6	2	25
	70 4	..	9	7	4	2	22

WRITE FOR DISCOUNTS.

SCULLY WELDLESS STEEL BOILER BRACE.

ALL SIZES CARRIED IN STOCK.

Diameter of Body	Length	Size of Shell End	Size of Head End	Weight, Each	List Price, Each
1 $\frac{1}{8}$ inches	24 inches	8 $\frac{1}{2}$ x 3 $\frac{1}{4}$ x $\frac{7}{16}$	6 $\frac{1}{2}$ x 2 $\frac{1}{4}$ x $\frac{7}{16}$	10 lbs.	\$0.70
1 $\frac{1}{8}$	30	"	"	12	.76
1 $\frac{1}{8}$	36	"	"	13 $\frac{1}{2}$	.82
1 $\frac{1}{8}$	42	"	"	15	.88
1 $\frac{1}{8}$	48	"	"	17	.94
1 $\frac{1}{8}$	54	"	"	18 $\frac{1}{2}$	.98
1 $\frac{1}{8}$	60	"	"	20	1.04
1 $\frac{1}{8}$	66	"	"	22	1.10
1 $\frac{1}{8}$	72	"	"	24	1.14
1 $\frac{1}{8}$	78	"	"	26	1.20
1 $\frac{1}{8}$	84	"	"	28	1.26
1 $\frac{1}{8}$	90	"	"	29 $\frac{1}{2}$	1.32
1 $\frac{1}{8}$	96	"	"	31	1.38
1 $\frac{1}{8}$	102	"	"	33	1.44
1 $\frac{1}{8}$	108	"	"	35	1.50
1 $\frac{3}{16}$	24	8 $\frac{1}{2}$ x 3 $\frac{1}{4}$ x $\frac{1}{2}$	6 $\frac{1}{2}$ x 2 $\frac{1}{4}$ x $\frac{1}{2}$	11	.74
1 $\frac{3}{16}$	30	"	"	13	.80
1 $\frac{3}{16}$	36	"	"	15	.86
1 $\frac{3}{16}$	42	"	"	17	.94
1 $\frac{3}{16}$	48	"	"	19	1.00
1 $\frac{3}{16}$	54	"	"	21	1.06
1 $\frac{3}{16}$	60	"	"	22	1.10
1 $\frac{3}{16}$	66	"	"	24	1.16
1 $\frac{3}{16}$	72	"	"	26	1.24
1 $\frac{3}{16}$	78	"	"	28	1.31
1 $\frac{3}{16}$	84	"	"	30	1.38
1 $\frac{3}{16}$	90	"	"	31 $\frac{1}{2}$	1.45
1 $\frac{3}{16}$	96	"	"	33	1.52
1 $\frac{3}{16}$	102	"	"	35	1.59
1 $\frac{3}{16}$	108	"	"	37	1.66
1 $\frac{1}{4}$	24	8 $\frac{1}{2}$ x 3 $\frac{1}{4}$ x $\frac{9}{16}$	6 $\frac{1}{2}$ x 2 $\frac{1}{4}$ x $\frac{5}{8}$	13	.78
1 $\frac{1}{4}$	30	"	"	15	.84
1 $\frac{1}{4}$	36	"	"	17	.94
1 $\frac{1}{4}$	42	"	"	19	1.00
1 $\frac{1}{4}$	48	"	"	21	1.08
1 $\frac{1}{4}$	54	"	"	23	1.12
1 $\frac{1}{4}$	60	"	"	25	1.20
1 $\frac{1}{4}$	66	"	"	27	1.26
1 $\frac{1}{4}$	72	"	"	29	1.34
1 $\frac{1}{4}$	78	"	"	31	1.42
1 $\frac{1}{4}$	84	"	"	33	1.50
1 $\frac{1}{4}$	90	"	"	35	1.58
1 $\frac{1}{4}$	96	"	"	37	1.66
1 $\frac{1}{4}$	102	"	"	39	1.74
1 $\frac{1}{4}$	108	"	"	41	1.82

WRITE FOR DISCOUNTS.



SCULLY HERCULES PRESSED STEEL BOILER LUGS AND HANGERS.

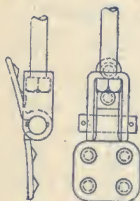
Patent applied for.

Pressed out of soft steel in one heat, retaining the full strength of the plate at all points. Grooves in base of lug to receive bearing rollers. May be riveted to shell in the usual way or drilled and used with hanger below.

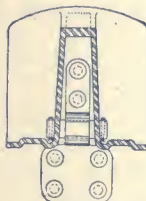
PRICE LIST AND DIMENSIONS.

Diam. Boiler, Inches.	Height Above Center.	Width of Lug.	Length Projec- tion.	Height on Boiler.	Thick- ness.	Shipping Weight, Lbs.	Price Each.
42	27 $\frac{3}{8}$	8	8	8	$\frac{1}{4}$	12	\$1.16
48	32 $\frac{3}{8}$	8	8	8	$\frac{1}{4}$	16	1.34
54	34 $\frac{1}{2}$	10	10	10	$\frac{1}{4}$	23	2.00
60	41 $\frac{1}{2}$	10	10	10	$\frac{1}{4}$	26	2.32
66	42 $\frac{1}{2}$	12	12	12	$\frac{1}{4}$	38	2.92
72	5	12	12	12	$\frac{1}{4}$	44	3.32
78	6	12	12	12	$\frac{1}{4}$	49	3.76
84	7	12	12	12	$\frac{1}{4}$	55	4.20

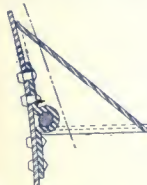
SCULLY HERCULES BOILER HANGERS.



Hanger Alone.



Hanger and Lug Combined.



Made for all sizes boilers, various weights. Prices on Application.

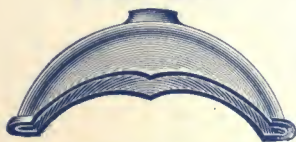
PRESSED STEEL HANGERS.



Description.	PRICE.
Steel Hangers $\frac{1}{4}$ in. thick	\$0.75 each.
$\frac{3}{8}$ in.	1.00

PRESSED STEEL CRABS.

For Man-Holes.



List Price, 60 cents each.

We can furnish these in any quantity desired.

WRITE FOR DISCOUNTS.

PRESSED STEEL BUCK STAYS.

Patented Jan. 30, 1906.

Pressed out of open-hearth steel, $\frac{1}{4}$ inch thick, 6 inches wide before bending. Measures $4\frac{1}{2}$ inches wide finished. Lighter, stronger and cheaper than cast iron or tee bars.

SIZES IN STOCK.

Thickness, Inches.	Width, Inches.	Length.	Weight, Lbs.
$\frac{1}{4}$	$4\frac{1}{2}$	8' 6"	43
$\frac{1}{4}$	$4\frac{1}{2}$	9' 6"	48
$\frac{1}{4}$	$4\frac{1}{2}$	10'	50
$\frac{1}{4}$	$4\frac{1}{2}$	10' 6"	53
$\frac{5}{16}$	$4\frac{1}{2}$	11'	74
$\frac{5}{16}$	$4\frac{1}{2}$	11' 6"	77
$\frac{5}{16}$	$4\frac{1}{2}$	12'	81

Other lengths and sizes furnished from factory.

SEAMLESS COPPER FERRULES.

Plain.



Flanged.

**LIST OF PLAIN FERRULES CARRIED IN STOCK.**

Inside Diameter in Inches.	Width in Inches.	1-16" THICK.	1-32" THICK.
		List Price Per 100.	List Price Per 100.
$1\frac{1}{2}$	$\frac{5}{8}$	\$11.00	\$ 7.00
$1\frac{3}{4}$	$\frac{5}{8}$	11.50	7.50
2	$\frac{5}{8}$	12.50	8.50
$2\frac{1}{4}$	$\frac{5}{8}$	16.50	10.50
$2\frac{1}{2}$	$\frac{5}{8}$	18.50	12.50
3	$\frac{3}{4}$	23.00	16.00
$3\frac{1}{2}$	$\frac{3}{4}$	28.00	22.00
4	$\frac{3}{4}$	34.00	27.00
Outside Diameter			
2	$\frac{5}{8}$	12.50	8.50

Flanged Ferrules and special sizes of Ferrules of either kind furnished from factory. Flanged Ferrules \$2.00 per 100 extra.

FORGED STEEL BOILER FLANGES.



Heavy hubs. Threads tested with Briggs' Standard gauge.
Perfect calking edge.

PRICE LIST.

Size of Pipe Inches	Diam. of Flange Inches	Thickness of Flange Inches	Depth of Flange Inches	Price, Bent or Flat, not Threaded	Price, Bent or Flat, and Threaded
$\frac{3}{4}$	6	$\frac{5}{16}$	1	\$ 2.28	\$ 2.40
1	6	$\frac{5}{16}$	1	2.28	2.40
$1\frac{1}{4}$	$6\frac{1}{2}$	$\frac{5}{16}$	1	2.28	2.40
$1\frac{1}{2}$	7	$\frac{3}{8}$	$1\frac{1}{4}$	2.28	2.40
2	8	$\frac{3}{8}$	$1\frac{1}{2}$	2.35	2.50
$2\frac{1}{2}$	$8\frac{1}{2}$	$\frac{3}{8}$	$1\frac{1}{2}$	2.45	2.60
3	9	$\frac{3}{8}$	$1\frac{1}{2}$	2.65	2.80
$3\frac{1}{2}$	$9\frac{1}{2}$	$\frac{7}{16}$	$1\frac{1}{2}$	3.00	3.20
4	10	$\frac{7}{16}$	2	3.35	3.50
$4\frac{1}{2}$	$10\frac{1}{2}$	$\frac{1}{2}$	2	4.00	4.20
5	$11\frac{1}{2}$	$\frac{1}{2}$	2	4.75	5.00
6	$12\frac{1}{2}$	$\frac{1}{2}$	2	5.70	6.00
7	14	$\frac{5}{8}$	$2\frac{1}{2}$	8.60	9.00
8	15	$\frac{5}{8}$	$2\frac{1}{2}$	11.40	12.00
9	$16\frac{1}{2}$	$\frac{5}{8}$	$2\frac{1}{2}$	17.00	20.00
10	$17\frac{1}{2}$	$\frac{5}{8}$	$2\frac{1}{2}$	21.00	25.00
12	21	$\frac{5}{8}$	$2\frac{1}{2}$	26.00	30.00

We carry from 100 to 500 flat flanges, and from 100 to 300 each of the following diameter bent flanges :

18, 24, 30, 36, 42, 48, 54, 60, 66 and 72 inch.

EXTRAS FOR ODD FLANGES.

Flanges 7 in. and smaller, bent to smaller than 18 in. 50% extra
Bending flanges 8 in. and larger to circles under 24 in.

subject to special prices.

Flanges threaded straight through 30% "
Flanges larger O. D. than standard — governed by outside diameter.

WRITE FOR DISCOUNTS.

FORGED STEEL TANK FLANGES.**MADE TO ORDER ONLY.**

Our New Standard Tank Flange is made to meet the need of tank makers where they require a flange lighter than the Standard Boiler Flange.

They are specially suited for attaching to thin plate work, as they are readily drawn into place.

PRICE LIST AND DIMENSION TABLE.

Nominal Size inches	Outside Diameter inches	Thick- ness inches	Depth of Hub inches	Diameter of Hub inches	Price Each, Flat		Price for Bending
					Threaded	Plain	
1	5	$\frac{3}{16}$	$\frac{11}{16}$	$1\frac{7}{8}$	\$1.60	\$1.40	\$0.20
$1\frac{1}{4}$	$5\frac{1}{2}$	$\frac{1}{4}$	$\frac{11}{16}$	$2\frac{3}{16}$	1.75	1.55	.20
$1\frac{1}{2}$	6	$\frac{1}{4}$	$\frac{3}{4}$	$2\frac{9}{16}$	2.00	1.80	.25
2	$6\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	$3\frac{1}{16}$	2.40	2.10	.25
$2\frac{1}{2}$	$7\frac{1}{2}$	$\frac{5}{16}$	1	$3\frac{9}{16}$	2.60	2.30	.30
3	8	$\frac{5}{16}$	$1\frac{1}{8}$	$4\frac{5}{16}$	2.80	2.65	.30
$3\frac{1}{2}$	$8\frac{1}{2}$	$\frac{5}{16}$	$1\frac{1}{8}$	$4\frac{13}{16}$	3.60	3.05	.35
4	$9\frac{1}{2}$	$\frac{3}{8}$	$1\frac{1}{8}$	$5\frac{3}{8}$	4.00	3.35	.35
$4\frac{1}{2}$	10	$\frac{3}{8}$	$1\frac{1}{4}$	$5\frac{7}{8}$	4.75	4.00	.40
5	11	$\frac{3}{8}$	$1\frac{5}{8}$	$6\frac{9}{16}$	6.50	4.75	.40
6	12	$\frac{3}{8}$	$1\frac{3}{8}$	$7\frac{1}{16}$	7.50	6.00	.45

Flanges are threaded with the standard taper thread.

The following list shows the circles to which tank flanges are bent:

- 1 in., $1\frac{1}{4}$ in., $1\frac{1}{2}$ in. 18, 24, 30, 36, 42, 48, 54, 60, 66, 72 in. circle.
 2 in., $2\frac{1}{2}$ in., 3 in. 30, 36, 42, 48, 54, 60, 66, 72 in. circle.
 $3\frac{1}{2}$ in., 4 in., $4\frac{1}{2}$ in., 5 in., 6 in. 48, 54, 60, 66, 72 in. circle.

Tank flanges other than flat or bent to circles shown above are subject to special price.

WE CAN ALSO FURNISH
Extra Heavy Boiler Flanges for
Single Riveting
And Extra Heavy Boiler Flanges for
Double Riveting

WRITE FOR DISCOUNTS.

HORSLEY PRESSED STEEL BOILER NOZZLES.

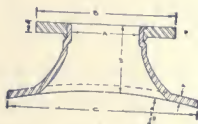


Patent applied for.

This nozzle is made by pressing the body out of $\frac{5}{8}$ " flange steel and the upper flange of 1" flange steel. The upper flange is bored and the outside of body is turned, after which the flange is heated and shrunk on; then the neck of lower body is hammered over to an angle of 45 degrees, and the flange is faced off true. The thinnest part of neck after facing is $\frac{5}{16}$ ".

Has been tested to 1,500 lbs. per square inch hydraulic pressure without sign of distress or leak. Can be riveted on a hydraulic or power riveter and caulked on the outside edge.

Stronger and better in every way than cast iron or cast steel.



SIZES IN STOCK.

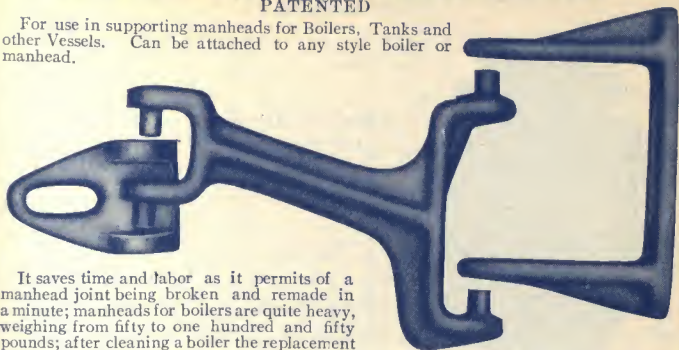
A	B	C	D	E	F	G	List Price
4"	10"	14 $\frac{3}{4}$ "	5 $\frac{1}{2}$ "	$\frac{13}{16}$ "	$\frac{9}{16}$ "	48" 54" 60"	\$13.50
5"	11"	15 $\frac{3}{4}$ "	6"	$\frac{15}{16}$ "	$\frac{5}{8}$ "	66" 72"	14.00
6"	12 $\frac{1}{2}$ "	17"	6"	$\frac{15}{16}$ "	$\frac{5}{8}$ "	60" 72"	15.00
7"	14"	19"	6"	1"	$\frac{5}{8}$ "	66" 78"	16.00
						72" 84"	
						78" 90"	

WRITE FOR DISCOUNTS.

CAHALL HINGED MANHEAD SUPPORT.

PATENTED

For use in supporting manheads for Boilers, Tanks and other Vessels. Can be attached to any style boiler or manhead.



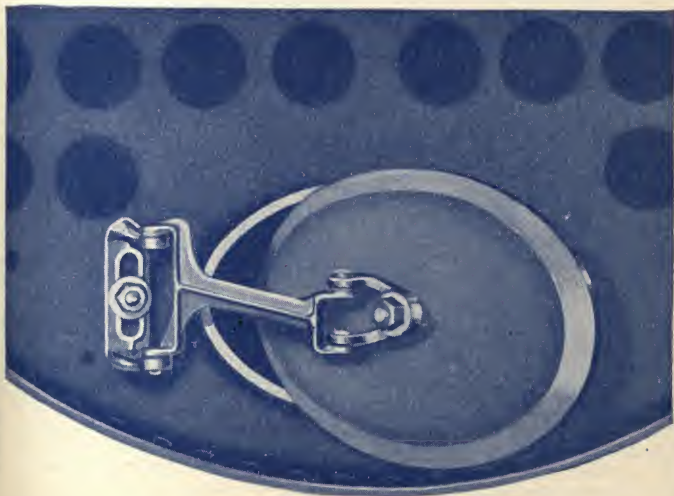
It saves time and labor as it permits of a manhead joint being broken and remade in a minute; manheads for boilers are quite heavy, weighing from fifty to one hundred and fifty pounds; after cleaning a boiler the replacement of these heavy manheads is a very trying task for the boiler attendant, unless the heads are equipped with this device.

Cut shows the different pieces of the hinge in position for assembling; it will be noted that the hinged arm hooks into the large lug, and the small lug hooks on to the hinged arm; this construction permits of very rapid assembling.

It saves gaskets by returning the manhead to its exact seat each time that the joint is broken; the hinge being pivoted at two points provides proper means for the take up of the gasket without putting any strain on the hinge parts or boiler.

Horizontal and vertical adjustment is provided for by the slotted bolt holes.

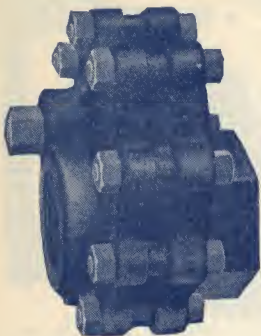
Cut below shows a manhead attached to the inside of a horizontal tubular boiler equipped with this support.



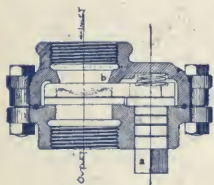
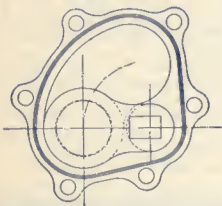
It is a necessity and no boiler should be without it. Boiler users will pay a good price for this device as an extra. **Price \$5.00** per support, which includes the three hinge parts, gasket for bolt, washers, and coupling bolts for attaching.

WRITE FOR DESCRIPTIVE CIRCULAR.

EVERLASTING BLOW-OFF VALVE.



Straight through. 250 pounds pressure. Guaranteed perfect service. No stuffing - box.



Patented and
Patents Pending

This valve is largely used in stationary service where a strong, substantial and dependable article is necessary. The valve needs no attention whatsoever from the engineer after being installed, being perfectly self-grinding and self-compensating at all points.

The valve is composed of a top and bottom bonnet, a disc and a lever and post, and is so simple that an inspection of the cut explains its entire operation.

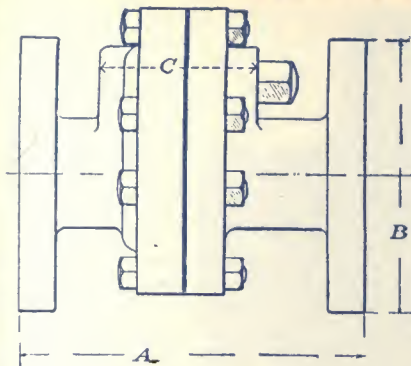
A wrench is placed upon the square head at "a" and pushed down, opening the valve, and reversed to close it; the effort to open it being in the 2 in. size, about 25 lbs. on an 8 in. lever against 200 lbs. steam pressure (about one-fifth that necessary to operate most plug cocks).

LIST PRICES.

Size, Inches.....	1	1½	2	2½	3	4	5
Iron Body, Screwed..	\$15.00	\$20.00	\$25.00	\$30.00	\$45.00	\$60.00	\$80.00
Semi-Brass, Screwed..	20.00	30.00	40.00	50.00	64.00	80.00	100.00
Solid Brass, Screwed..	30.00	40.00	55.00	70.00	80.00	100.00	120.00
Iron Body, Flanged..	18.00	24.00	29.00	35.00	48.00	70.00	90.00
Semi-Brass, Flanged..	24.00	35.00	45.00	55.00	70.00	90.00	110.00
Solid Brass, Flanged..	35.00	46.00	62.00	79.00	90.00	115.00	134.00

WRITE FOR DISCOUNTS.

EVERLASTING BLOW-OFF VALVE. FLANGED TYPE.



Size	Dimensions		
	A	B	C
1"			2½" S. E. only
1½"	7½"	6"	4½"
2"	8½"	6½"	4½"
2½"	9½"	7½"	5"
3"	11½"	8¼"	5¼"

Copy of Report of Test

ROBERT W. HUNT
JNO. J. CONE

A. W. FIERO

JAS. C. HALLSTED
D. W. McNAUGHER

ROBERT W. HUNT & Co., ENGINEERS

BUREAU OF INSPECTION, TESTS AND CONSULTATION

GENERAL OFFICES "THE ROOKERY" CHICAGO
TELEPHONE "HARRISON 466"

CHICAGO, Feb. 26, 1908.

SCULLY STEEL & IRON CO.
Halsted, Fulton and
Wayman Sts., Chicago

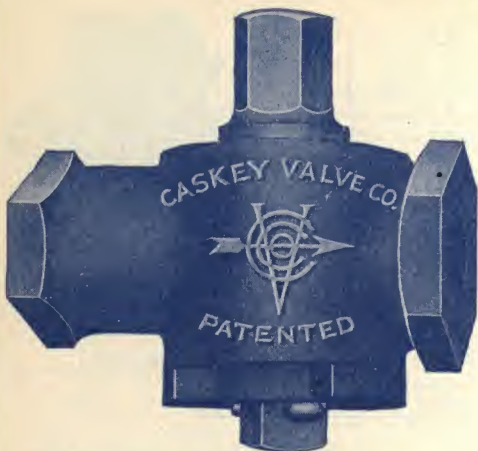
Gentlemen:

Regarding the test of your standard 2½" iron body "Everlasting Blow-Off Valve," made under recent date, we beg to report that the same was tested to a hydrostatic pressure of 1875 lbs. per square inch, when the outlet side of the bonnet fractured.

Yours truly,
ROBERT W. HUNT & CO.

WRITE FOR EVERLASTING VALVE BOOKLETS

CASKEY HYDRAULIC VALVES. HYDRAULIC STOP VALVE.



3,000 to 5,000 pounds pressure

Caskey type of valve for cutout duty; pressures up to 10,000 pounds pressure per square inch. This valve earned its reputation in the hydraulic field, because it stood more pressure and harder wear, with a minimum of repairs, than any other valve.

This valve can always be depended upon to work and cut off pressures quickly. It is sensitive as a choker or throttle. It never deteriorates from being idle. It

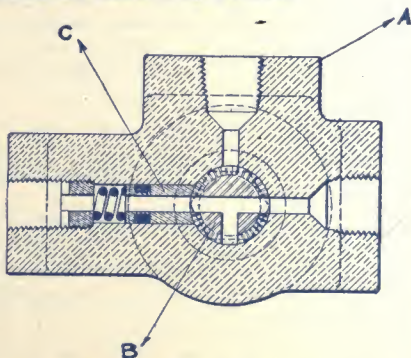
is a tight valve under pressure, and never jams. To maintain this valve costs practically nothing.

Made in three weights; for pressures of 500 to 1,000 pounds, 1,500 to 2,500 pounds, and 3,000 to 5,000 pounds.

10,000 pounds pressure valves built special.

SINGLE-ACTING OPERATING VALVE.

The valve consists of a body A, straight plug B and the bushing C. Plug B fits into body A, and bushing C is ground to fit plug B. To insure contact of B and C when not under pressure, a spring is provided. Under pressure, the valve becomes pressure-packed.



3,000 to 5,000 pounds pressure. Sectional view and details of description

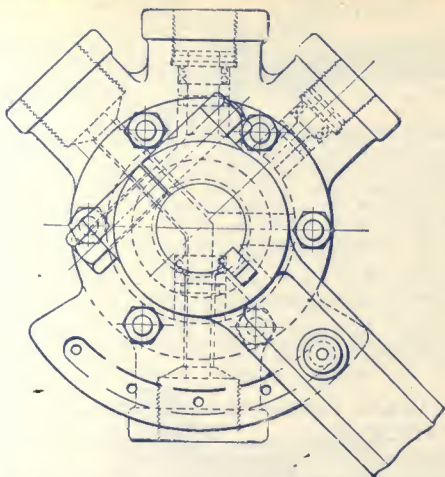
BRONZE BODY, HARDENED AND GROUND STEEL PLUG.

Standard Sizes, Screwed Ends, $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1", $1\frac{1}{4}$ ", $1\frac{1}{2}$ " and 2"
Standard Sizes, Flanged Ends, 1", $1\frac{1}{4}$ ", $1\frac{1}{2}$ " and 2"

Special sizes to order.

WRITE FOR COMPLETE CATALOG AND PRICES.

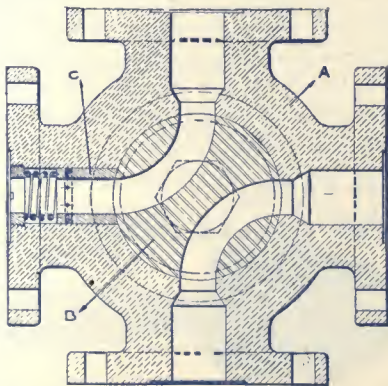
CASKEY HYDRAULIC VALVES.



TWO-PRESSURE OPERATING HYDRAULIC VALVE.

Note that all functions are controlled by one operating lever, not possible in any other type of valve. Illustration shows the two-pressure type.

Made with screwed and flanged ends; standard sizes $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch. The above sizes are of the low-pressure intake. Larger sizes than 1 inch will be designed to suit conditions.



FOUR-WAY HYDRAULIC VALVE.

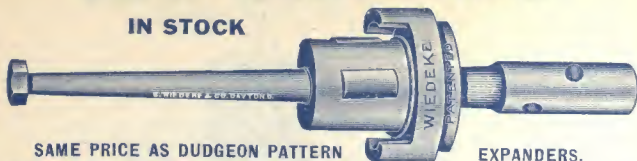
The valve consists of body A, straight plug B and bushing C. Plug B fits into body A and bushing C is ground to fit plug B. To insure contact of B and C, when not under pressure, a spring is provided. Under pressure, the valve becomes pressure-packed.

Bronze body, hardened and ground steel plug; standard sizes of intake, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$ inches. Special sizes to order.

WRITE FOR COMPLETE CATALOG AND PRICES.

WIEDEKE ROLLER EXPANDER.

IN STOCK



SAME PRICE AS DUDGEON PATTERN

EXPANDERS.

The "Wiedeke" expander has patented improvements over a well known similar type expander. A vital point overcome is, the body of this expander and the collar are one piece, avoiding the constant delay of the collar and pin getting loose, breaking and getting lost. The "Wiedeke" has no screws in it to get loose, break off or get lost, and the guard which is held in place by a spring can also be removed.

Size.	Outside Diameter of Tube in inches.													
	1¼	1½	1¾	1⅞	2	2¼	2½	2¾	3	3¼	3½	4	4½	5
PRICE LIST.	\$10.00	10.00	10.00	10.00	10.00	12.00	14.00	16.00	18.00	20.00	23.00	30.00	40.00	50.00
Price Mandrels	\$2.40	2.40	2.40	2.60	2.70	3.10	3.50	3.70	4.00	4.60	5.00	6.70	7.90	11.00
Price, set of 3 Rolls	\$0.80	.90	.95	1.05	1.10	1.25	1.35	1.50	1.60	1.75	2.00	2.50	3.50	4.00

IDEAL SELF-FEED EXPANDER.

IN STOCK



Fig. 40.

FOR POWER OR HAND USE.

Made entirely of steel, tempered with the greatest care. Rolls cannot fall in or out when mandrel is removed; rolls are double length and reversible; can be used by hand or any kind of power machine without any change. Has phosphor bronze bearing, preventing friction and wear, a bearing impossible to get out of order, and saving half the labor either way.

Size	Outside Diameter of Tube in inches.													
	1¼	1½	1⅝	1¾	1⅞	2	2⅞	2¼	2½	2¾	3	3¼	3½	4
PRICE LIST Expan. Com.	16.00	16.00	16.00	16.00	16.00	16.00	18.00	18.00	19.50	22.00	22.00	24.50	24.50	27.00
Mandr'l only	3.90	3.90	3.90	3.90	3.90	3.90	4.40	4.40	5.10	6.40	6.40	8.60	8.60	9.90
Set of 3 rolls	.38	.38	.38	.38	.38	.38	.45	.45	.50	.60	.60	.75	.75	.80

CAP ROLLER EXPANDER.

IN STOCK.



For B. & W. and other Water Tube Boilers.

Tube Size	List Price Each	Extra Mandrel	Extra Set of 3 Rolls
4 inch	\$50.00	\$10.00	\$6.00

Extra Single Jointed Mandrel \$14.00

Extra Double Jointed Mandrel \$18.00.

N. B. We can also furnish from factory expanders for Heine and other Water Tube Boilers.

WRITE FOR DISCOUNTS.

SECTIONAL SPRING EXPANDERS. PROSSER PATTERN.



With Round Pin.



With Octagon Pin.

IN STOCK.

Outside Dia. of Tube.	Thick-ness of Plate.	LIST PRICE.	Price Extra Pins.	Outside Dia. of Tube.	Thick-ness of Plate.	LIST PRICE.	Price Extra Pins.
1¼ in.	⅝ in.	\$11.00	\$1.70	2¾ in.	½ in.	\$18.00	\$2.90
1½	¾	11.00	1.90	3	⅝-½	22.00	3.10
1¾	¾-½-⅝	11.00	2.10	3¼	⅝	26.00	3.60
1⅞	⅞	11.00	1.75	3½	¾-½	30.00	3.90
2	⅞-¾-½	12.00	2.30	4	⅞	33.00	4.70
2½	¾	13.00	2.25	4½	1	37.00	5.50
2¾	⅞-¾-½	13.00	2.50	5	1⅞	42.00	8.00
2⅞	¾-½	15.00	2.70	6	1½	60.00	12.00

LUCAS PNEUMATIC TUBE EXPANDER.

Saves Time. Saves Labor.

Adopted by several big rail-roads.

Write for details.



Patented and Patent applied for.

Operated by long-stroke pneumatic riveting hammer; works easily; pin will not stick; can be turned readily by operator; expands 100 tubes per hour; does perfect work; cannot injure flue or flue-sheet; made of high-grade tool steel, guaranteed.

PRICE LIST.

1¼ inch	\$12.00	2⅞ inch	\$12.00
1½ inch	12.00	2½ inch	13.00
2 inch	12.00	2½ inch	15.00

LUCAS ROUND-HOUSE TUBE EXPANDER.



Patented and Patent applied for.

For tightening locomotive flues in round-house. Will work 200 flues per hour and make them tight without further use of beading tool. Made to fit either long-stroke or No. 3 chipping hammer—we recommend the light hammer. List prices same as Lucas Pneumatic Expanders.

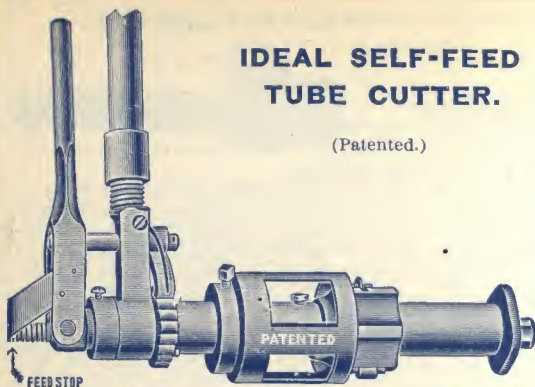
LUCAS FERRULE EXPANDER.



Patent applied for.

For expanding copper ferrules in flue holes before inserting tubes, used in light chipping hammer—works much faster than roller or hand expander. Made with hexagon shank so operator can turn expander with pneumatic hammer. List prices same as Lucas Pneumatic Expanders.

WRITE FOR PRICES.



IDEAL SELF-FEED TUBE CUTTER.

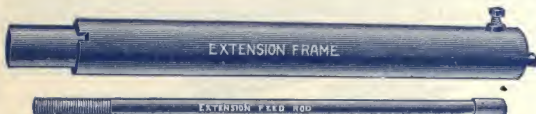
(Patented.)

PRICE LIST.

2 in....	\$14.00
2¼	14.00
2½	14.00
3¼	16.00
3	20.00
3¼	20.00
3½	22.00
4	22.00
4½	30.00
5	32.00
6	32.00

Will cut off new or old tubes inside or outside of the boiler head.
Operated by one man. Made of steel, strong, simple and durable.

SMOKE-BOX EXTENSION.



PRICE LIST.

2 to 2¼ in.	\$3.80
3 4	4.50
4½ 6	7.00

All sizes carried in stock.

THORNTON FLUE CUTTER. IN STOCK.

For use in connection with reversible air-drill. Used to trim tubes before expanding. Will cut three to four tubes per minute. Made in two sizes.



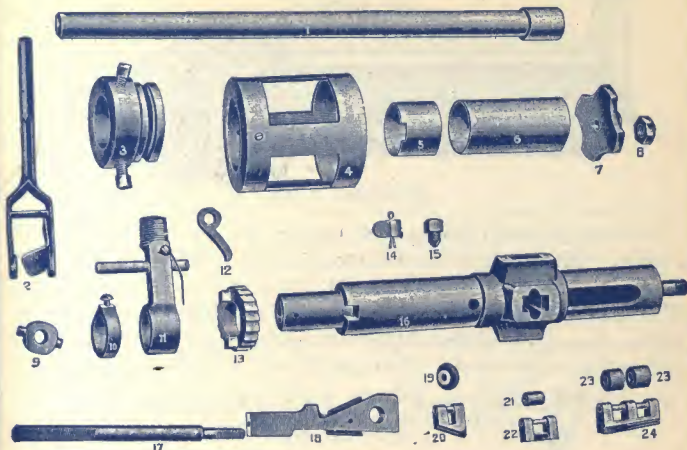
(Patented.)

LIST PRICES.

- No. 1. Cuts 2 inch, 2¼ inch and 2½ inch tubes\$100.00
No. 2. Cuts 3 inch, 3½ inch and 4 inch tubes..... 100.00

WRITE FOR DISCOUNTS.

PARTS FOR IDEAL SELF FEED TUBE CUTTER.



LIST PRICE.

NAME OF ARTICLE.	No. of Piece.	2	2½	3	3½	4	4½	5	5½	6
Ratchet Hndl..	1	\$.40	\$.40	\$.40	\$.40	\$.50	\$.50	\$.50	\$.50	\$.80
Feed Handle..	2	.50	.50	.50	.50	.50	.50	.60	.60	.60
Guard Sleeve.	3	1.10	1.10	1.10	1.10	1.20	1.20	1.30	1.30	2.00
Guard.....	4	1.10	1.10	1.10	1.20	1.30	1.30	1.40	1.40	2.80
Short Bushing.	5	.50	.50	.50	.50	.50	.50	.60	.60	.60
Long Bushing.	6	1.00	1.00	1.00	1.00	.50	.50	.50	.60	.60
Centering Guide Ring.	7	.10	.10	.10	.10	.40	.40	.40	.60	.70
Nut.....	8	.10	.10	.10	.10	.10	.10	.10	.20	.20
Feed Nut....	9	.40	.40	.40	.40	.40	.40	.50	.50	.50
Ratchet Collar	10	.20	.20	.20	.30	.30	.30	.30	.35	.35
Ratchet Frame	11	1.50	1.50	1.50	1.60	1.60	1.60	1.60	2.00	2.00
Ratchet Pawl.	12	.20	.20	.20	.20	.20	.20	.20	.30	.30
Ratchet Wheel	13	.80	.80	.80	.80	.80	.80	.80	1.00	1.00
Split Cotter and Stop...	14	.20	.20	.20	.20	.10	.10	.10	.15	.15
Stop Bolt....	15					.10	.10	.10	.15	.15
Frame.....	16	5.80	5.80	5.80	5.80	11.00	11.00	11.00	15.00	15.00
Feed Rod...	17	.75	.75	.75	.75	.75	.75	.75	.90	.90
Feed Wedge...	18	1.70	1.70	1.70	1.70	1.70	1.70	1.70	2.00	2.00
Cutter Wheel.	19	.25	.25	.25	.25	.25	.25	.25	.40	.40
Cutter Carrier.	20	.80	.80	.80	.80	.80	.80	.80	1.30	1.30
Roll for Single Roller Carrier.	21				.25	.25	.25	.25	.35	.35
Roller Carrier.	22				.80	.80	.80	.80	1.00	1.00
Single Roller Carrier....	23				.25	.25	.25	.25	.50	.50
Rolls for Dble. Roller Carrier.	24				1.60	1.60	1.60	1.60	2.60	2.60

NOTICE:—When ordering Tube Cutter Parts ALWAYS STATE NUMBER OF PIECE and for WHAT SIZE Tube Cutter wanted.

WRITE FOR DISCOUNT.

RAILROAD FLUE CUTTER. IN STOCK.

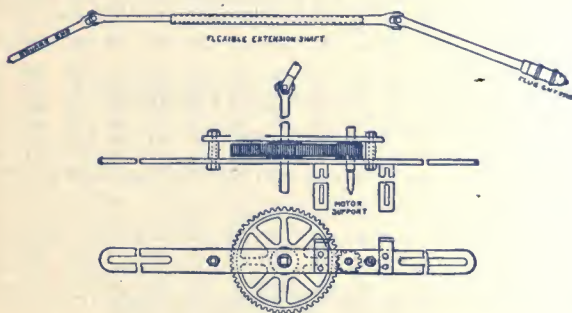


A very quick-working tool for cutting out old flues $2\frac{1}{4}$ inch and smaller. Operates in connection with air drill. Should be suspended on cross bar which supports air drill. Cuts off flues in $1\frac{1}{2}$ revolutions of cutting knife. Cuts the flue off square and without a burr. The spring arrangement returns cutter to its original position after each cut and the motor never stops. One man can cut out 200 to 300 flues per hour with this tool.

Price of Flue Cutter, as shown, $1\frac{1}{4}$ ", 2", or $2\frac{1}{4}$ ".....\$20.00

GEARING AND CROSS-BAR FOR RAILROAD FLUE CUTTER.

Front End Arrangement.



This arrangement, by gearing down 6 to 1, permits the use of a small size air drill. If larger size is available, it can be attached to the square end on direct drive.

List Price for Gearing and Cross-Bar as shown, not including air-motor or flue cutter.....\$40.00

WRITE FOR DISCOUNTS.

ONE-WHEEL AND ROLLER PIPE CUTTER. IN STOCK.



Parts are duplicates and are interchangeable with parts of the ORIGINAL SAUNDERS CUTTER.

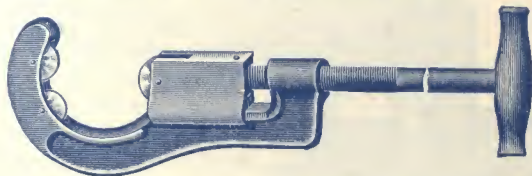
LIST PRICES.

No.	Cuts Pipe	Cuts Boiler Tubes	List Price Compl'e	Extra Cutter Wheels	Extra Blocks & Wheels	Extra Rollers	Extra Pins	Extra Handles
S 1	1/8 to 1 in.	.....	\$ 3.00	\$0.24	\$1.25	\$0.24	\$0.10	\$1.00
S 2	1 to 2 in.	1 1/4 to 2 1/4 in.	4.50	.32	1.75	.32	.10	1.25
S 3	2 to 3 in.	2 1/4 to 3 1/2 in.	11.00	.60	2.75	.50	.15	2.25
S 4	2 1/2 to 4 in.	3 to 4 1/2 in.	18.00	.60	3.50	.50	.15	2.25
S 5	4 to 6 in.	4 1/2 to 6 in.	28.00	.60	4.00	.60	.15	3.25

THREE-WHEEL PIPE CUTTERS. IN STOCK.



This cut illustrates Nos. 1 and 2, cutting pipe 1/8 to 2 in. in diameter.



This cut illustrates the six larger sizes, for pipe 1 1/2 to 12 in. in diameter.

All parts are duplicates and are interchangeable with parts of the ORIGINAL BARNES CUTTER.

PRICE LIST.

No.	Cuts Pipe	Cuts Boiler Tubes	Price	Cutter Wh'ls	Wheel Pins, Per Dozen	Hooks	Slides	Nuts	Hdls.	Ap- prox. Wt.
1	1/8 to 1 in.	.....	\$ 4.50	\$0.25	\$1.00	\$ 1.75	\$0.75	\$0.25	\$1.00	3 lbs.
2	1 to 2 in.	1 1/4 to 2 1/4 in.	6.00	.30	1.00	2.60	1.00	.25	1.25	5 lbs.
3	1 1/2 to 3 in.	1 3/4 to 3 1/2 in.	10.00	.40	1.00	4.55	2.00		2.25	8 1/2 lbs.
4	2 1/2 to 4 in.	3 to 4 1/2 in.	20.00	.50	2.00	9.50	4.50		4.50	14 lbs.
5	4 to 6 in.	4 1/2 to 6 in.	30.00	.75	2.00	13.75	7.00		7.00	22 1/2 lbs.
6	6 to 8 in.	.....	40.00	.75	2.00	20.00	8.50		9.25	27 1/2 lbs.
6 1/2	8 to 10 in.	.....	45.00	.75	2.00	23.00	9.50		10.25	34 lbs.
7	9 to 12 in.	.....	50.00	.75	2.00	25.00	11.25		11.50	51 lbs.

WRITE FOR DISCOUNTS.

SCULLY FLUE-HOLE CUTTER.

This is the strongest flue-hole cutter on the market. Made of steel throughout, with tool steel knives and reamer. The knives are $4\frac{1}{2}$ inches long and of the same shape their entire length, so require little grinding and last a long time. The center reamer and shank are removable.

Shank is No. 3 Morse Taper but can be furnished blank if desired.

LIST PRICES

Number.	Will Cut Holes.	List Price Each.
4	4 in. to $4\frac{1}{8}$ in.	\$20.00
$3\frac{1}{2}$	$3\frac{1}{2}$ in. to $3\frac{9}{16}$ in.	18.00
3	3 in. to $3\frac{1}{8}$ in.	16.00
$2\frac{1}{2}$	$2\frac{1}{2}$ in. to $2\frac{9}{16}$ in.	15.00
2	2 in. to $2\frac{1}{8}$ in.	14.00
$1\frac{7}{8}$	$1\frac{7}{8}$ in. to $1\frac{9}{16}$ in.	12.00

Extra Cutter Knives, per set. \$2.00

Extra Center Reamers, each. 1.20

All sizes in stock.

SCULLY ADJUSTABLE FLUE-HOLE CUTTER.

Patent Applied for

A solid, positive cutter arranged for several sizes, the knives being changed in position to get the size required. Made in two sizes, removable shank and reamer, with high-speed steel knives.

No. 1, Railroad size, for $1\frac{3}{4}$, $1\frac{7}{8}$, 2, $2\frac{1}{8}$, $2\frac{1}{4}$ and $2\frac{1}{2}$ inch flue holes, with No. 4 Morse Shank. \$20.00

No. 2, General size, for $2\frac{1}{2}$, $2\frac{3}{4}$, 3, $3\frac{1}{4}$, $3\frac{1}{2}$ and 4 inch flue holes, with No. 4 Morse Shank. . . \$25.00.

WRITE FOR DISCOUNTS.



PERFECTION FLUE CLEANER.

For Cleaning
Smoke Flues.

The Cleaner is light, strong and simple, and the knives are so made that they are always sharp. Heads are steel drop forgings.

Will clean welded flues as nicely as old ones, and remove the scales from tubes without cutting the metal.

Cleans hot or cold flues without changing the temper.

It has no screws nor rivets in its construction, and yet is the strongest cleaner made.

Can be operated by a flexible handle, thus permitting its use in small fire rooms or where space is limited.

Will send cleaners on trial, to be returned at our expense if not found satisfactory.

Size of Flue.	LIST PRICE.	Size of Flue.	LIST PRICE.	Size of Flue.	LIST PRICE.
1 1/4 in.	\$2.00	2 1/2 in.	\$2.50	4 in.	\$4.00
1 1/2	2.00	2 3/4	2.75	4 1/2	5.00
1 3/4	2.00	3	3.00	5	6.00
2	2.00	3 1/4	3.25	6	7.00
2 1/4	2.25	3 1/2	3.50		

Flexible Links.....\$1.00 each

We carry all sizes in stock for immediate shipment.

DEMON TUBE CLEANER.



For Water-Tube Boilers.

This is a water-power driven machine for use in straight-tube boilers. The only cleaner that has power enough to use a positive acting and scale-crushing head. The head is non-yielding, so the cleaner gets **all** the scale.

THE TORPEDO.

THE TORPEDO
REMOVES ALL SCALE FROM TUBES OF
FIRE TUBE BOILERS
SAVES 25% OF FUEL FOR EACH 1/8 INCH
IN THICKNESS OF SCALE
Prolongs Life of Tubes
SAVES COMPOUND
CENTERS ITSELF IN TUBE
STRIKES SAME IN EVERY DIRECTION
STROKE IS LIMITED AND CUSHIONED
DOES NOT HAMMER BUT VIBRATES
THE TUBE
IS ABSOLUTELY SAFE AND EASILY
OPERATED
HAS BUT ONE MOVING PART
WILL LAST A LIFETIME



The Only Tool for Cleaning Outside of Fire Tubes.

The torpedo jars the scale off by a wonderful vibratory action of 11,000 vibrations per minute. Cannot damage tube, but is a thorough, rapid cleaner.

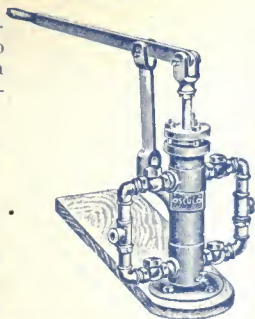
WRITE FOR PRICES.

SCULLY BOILER TEST PUMP.

This is a double-acting pump of substantial design and build, for pumping up to 500 pounds pressure. It has brass piston (packed), brass piston rod and forged connections.

Diameter of piston.....2 inches
 Length of stroke.....5 inches
 Suction pipe.....1 inch
 Discharge pipe..... $\frac{3}{4}$ inch
 Weight.....60 pound
 List price.....\$50.00

Can be repacked or cleaned conveniently by unbolting and lifting pump off its base.



BOILERMAKERS' SCREW PLATE.

For threading and re-pointing staybolts. Stock 25 inches long, with adjustable dies for $\frac{3}{4}$ inch, $\frac{7}{8}$ inch and 1 inch diameter bolts, 12 threads per inch.

List price, packed in neat hardwood boxes, as shown in cut.....\$10.00



MALLEABLE CLAMPS.



For boilermakers.

These are strong, well-made, practical clamps. The screw is made of high-grade tool steel and has Acme thread.

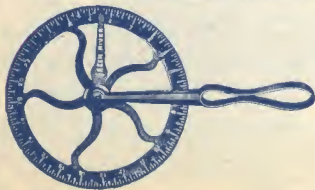
Size No. 3.

Height of throat, 3 inches.

Width of throat, 3 inches.

List price.....\$5.00

GRADUATED TIRE-MEASURING WHEEL.



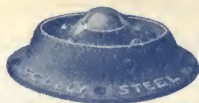
The figures and lines are raised above the surface of the wheel and cannot be filled or defaced with rust or dirt.

Light, accurately fitted, handy and strong.

Price.....\$3.00

WRITE FOR DISCOUNTS.

BALL-BEARING CASTERS.

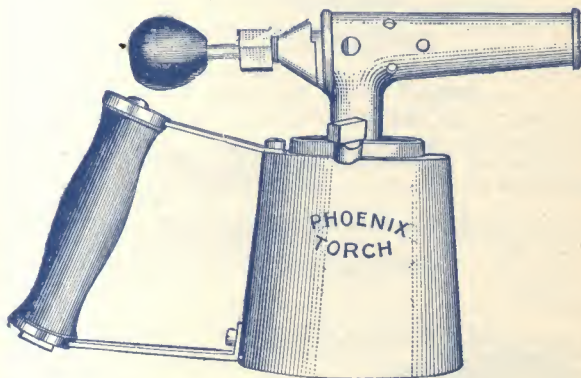


IN STOCK.

To be fastened to table in front of punch or other machinery. Better than overhead jib crane—Saves time—Try them. The large steel ball runs on fifty or more small balls in pressed steel cup. The balls are of hardened tool steel, accurately ground and will stand any amount of rough usage.

List Price, each.....\$1.20

PHOENIX GASOLINE TORCHES SELF-CLEARING BURNER



Safe, simple and strong. No pump to get out of order. Gives 2500 degrees of heat.

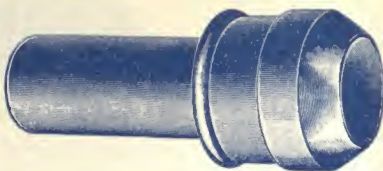
Turned cast metal-container specially adapted for rough wear. No loose parts, fittings or tools required.

Suitable for all purposes where an intense heat is wanted. Will heat $\frac{3}{8}$ -inch and lighter steel in a few minutes. By using 3 or 4 torches any corner flanging or boiler-bag work may be done. Lightest, smallest and most convenient torch made.

Price, net each.....\$3.50

TOOLS FOR PNEUMATIC HAMMERS, ETC. RIVET SETS.

These are made of high-grade tool steel carefully hardened and tempered, and guaranteed by us to be first class in every way. All sizes in stock, round or cone head, to fit all pneumatic riveting hammers.



Price each, \$1.60
Dozen lots. each, 1.50

SCULLY STAY-BOLT HEADER.

Does Perfect Work. Saves 50 Per Cent. Time.



This tool fits into a pneumatic hammer, same as a rivet set, and is used to upset and finish stay bolts. The center point holds the tool to the bolt and makes a quick, perfect job. Made of good tool steel and

carefully tempered. Will send on trial to responsible parties.

Price, all sizes each, \$2.00

KELLY TUBE FLARING TOOL.

This tool turns over the ends of tubes before expanding. Works very rapidly and does not crack or injure tubes.

Each.
Price, 2 ins. and smaller..\$2.50
2¼ ins. 3.00
2½ ins. 4.00
3 ins. 5.00



REVERSIBLE STAY-BOLT CHUCK.

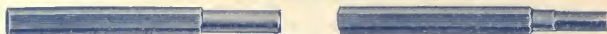
For turning stay bolts in fire-boxes. Saves heading the bolts. Has Morse taper shank and removable inner chuck, keyed in. Turns bolts in or out. Positive grip all the time—does not slip. This tool is being used in large railroad shops. Will send on trial. Guaranteed to work satisfactorily.



Patented 1908.

List Price, complete. \$10.00
Extra Inner Chucks. 5.00

WRITE FOR DISCOUNTS.

CHISELS, Etc., for PNEUMATIC HAMMERS.**PNEUMATIC CHISEL BLANKS.**

- $\frac{3}{4}$ in. Oct., 9 in. long Round Shank.....\$0.90 each
 $\frac{3}{4}$ in. Oct., 9 in. long, Hexagon Shank..... 1.20 each

PNEUMATIC CHISELS.

- $\frac{3}{4}$ in. Oct., 9 in. long, Hexagon Shank..... \$1.50 each

PNEUMATIC BEADING TOOLS.

- $\frac{3}{4}$ in. Oct., 9 in long, Round Shank \$1.60 each

PNEUMATIC CALKING TOOLS.

- No. 1. Square Point, $\frac{3}{4}$ in. Oct., 9 in. long, Round Shank \$1.30 each
 No. 2. Round Point, $\frac{3}{4}$ in. Oct., 9 in. long, Round Shank. 1.30 each

PNEUMATIC DIAMOND POINT CHISELS.

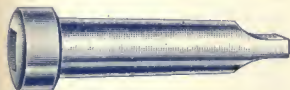
- $\frac{3}{4}$ in. Oct., 9 in. long, Hexagon Shank\$1.70 each

PNEUMATIC CAPE CHISELS.

- $\frac{3}{4}$ in. Oct., 9 in. long, Hexagon Shank.....\$1.60 each

PNEUMATIC ROUND-NOSE CHISELS.

- $\frac{3}{4}$ in. Oct., 9 in. long, Hexagon Shank.....\$1.60 each

**SQUARE TAPER DRILL SOCKETS.****FITTED TO MORSE TAPER.**

For use with Air Drills.

No.	Size of Shank	Socket		Price Each
		Small End	Large End	
1	No. 1 Morse	$\frac{5}{8}$ inch Square	$\frac{5}{8}$ inch Square	\$1.00
2	No. 2 Morse	$\frac{3}{8}$ inch Square	$\frac{5}{8}$ inch Square	1.25
3	No. 3 Morse	$\frac{3}{8}$ inch Square	$\frac{5}{8}$ inch Square	1.50
4	No. 4 Morse	$\frac{1}{2}$ inch Square	$\frac{3}{4}$ inch Square	1.75
5	No. 5 Morse	$\frac{1}{2}$ inch Square	$\frac{3}{4}$ inch Square	2.50
x	No. 3 Morse	$\frac{3}{4}$ inch Square	$\frac{3}{4}$ inch Square	4.00

N. B.—The X size has $\frac{3}{4}$ in. straight square socket $1\frac{1}{8}$ in. deep to fit roller expander pins.

WRITE FOR DISCOUNTS.

BOILERMAKERS' TOOLS.

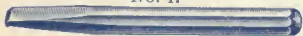
Forged especially for us from high grade Tool Steel.

IN STOCK.**RIVET TONGS** 18 and 30 in. lengths. Price, \$1.00 each.**BEADING TOOLS** 8 in. long.

Price, 75c. each.

CAULKING TOOLS.

No. 1.



No. 2.



Both 8 in. long. Price, 60c. each.

FLAT CHISEL.

8 in. long. Price, 60c. each.

CAPE CHISEL.

8 in. long. Price, 60c. each.

DIAMOND POINT CHISEL.

8 in. long. Price, 60c. each.

ROUND NOSE CHISEL AND RIVET TOOL.

8 in. long. Price, 60c. each.

PLOW CHISEL.

8 in. long. Price, 60c. each.

CENTER PUNCH.

6 in. long. Price, 60c. each.

DRIFT PINS.

7 in. long. Price, 25c. each.

We carry these for $\frac{1}{2}$, $\frac{3}{8}$, $\frac{1}{4}$ and $\frac{3}{16}$ rivets**MARKING PUNCHES.**

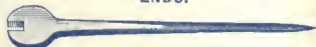
We carry these for all sizes of rivets.

Price, $\frac{1}{4}$ to $\frac{1}{2}$, 6 in. long, \$1.25 each. $\frac{3}{8}$ $\frac{1}{2}$ 1.50**HALF-ROUND REAMERS.**We carry these for $\frac{1}{4}$, $\frac{5}{16}$, $\frac{11}{16}$ and $\frac{3}{4}$ rivets.

8 in. long. Price, \$1.25 each.

BURR TOOL.

8 in. long. Price, \$1.25 each.

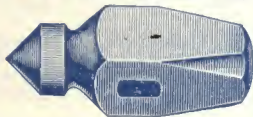
TRACK WRENCHES WITH POINTED ENDS.

Write for prices.

BOILERMAKERS' WRENCH.We carry these for $\frac{1}{2}$, $\frac{3}{8}$, $\frac{1}{4}$ and $\frac{3}{16}$ bolts.

18 in. long. Price \$1.00 each.

Other sizes of wrenches made to order.

BOBBING PUNCH OR TOOL.We carry these for $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and $\frac{7}{8}$ rivets.Weight $2\frac{1}{4}$ lbs. Price, \$1.50 each.**HARDIES.****FLATTERS.**

Price, \$1.25 each.

3 in. Square Face
Price, \$2.00 each.**SPECIAL TOOLS MADE TO ORDER****WRITE FOR DISCOUNTS.**

BOILERMAKERS' HAMMERS AND TOOLS.

Forged especially for us from high grade Tool Steel.

RIVETING.

2½ lbs, \$1.75 each



2½ lbs., \$1.50 each

CHIPPING.Wt., 1½ & 2 lbs.
Price, \$1.60 ea.**MACHINISTS.**Weight, 1½ lbs.
Price, \$1.40 ea.**PLUGGING.**

Weight, 2½ lbs. Price, \$1.75 each.

BEVEL FACE.

Weight, 2½ lbs. Price, \$1.80 each.

PICK.

Weight, 3¼ lbs. Price, \$1.90 each.

BRIDGE BUILDERS No. 1.

Weight, 4 lbs. Price, \$1.90 each.

BRIDGE BUILDERS No. 2.

Weight, 4½ lbs. Price, \$1.90 each.

FLOGGING.Weight, 5, 6, 7 and 8 lbs.
Price, 40c. per lb.**DOUBLE FACE SLEDGE**Weight, 10, 12, 14 and 16 lbs.
Price, 40c. per lb.**IN STOCK.****CONICAL RIVET SNAPS.**

Price, each.

We carry these for ¾, 1, 1½, 2, 2½, 3, 3½, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 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616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 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1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962,

HANDLED HAMMERS.**SOLID CAST STEEL. HICKORY HANDLES.****MACHINISTS'.****BALL PEIN. STRAIGHT PEIN. CROSS PEIN.**

Nos.	Weight	Per Dozen	Nos.	Weight	Per Dozen
00000	4 oz.	\$12.00	3	1 lb. 12 oz.	\$15.50
0000	6 oz.	12.00	4	2 lbs.	16.50
000	8 oz.	12.00	5	2 lbs. 4 oz.	17.50
00	12 oz.	12.00	6	2 lbs. 8 oz.	19.00
0	1 lb.	12.50	7	2 lbs. 12 oz.	20.50
1	1 lb. 4 oz.	13.50	8	3 lbs.	22.00
2	1 lb. 8 oz.	14.50			

ENGINEERS'.

Nos.	Weight	Per Dozen	Nos.	Weight	Per Dozen
0	1 lb. 2 oz.	\$12.00	4	3 lbs.	\$16.00
1	1 lb. 10 oz.	13.00	5	3 lbs. 8 oz.	17.00
2	2 lbs.	14.00	6	4 lbs. 8 oz.	19.00
3	2 lbs. 8 oz.	15.00			

DOUBLE FACE ENGINEERS'.

Nos.	Weight	Per Dozen	Nos.	Weight	Per Dozen
1	1 lb. 8 oz.	\$14.50	3	3 lbs.	\$18.00
2	2 lbs. 6 oz.	16.50	4	3 lbs. 10 oz.	19.50

**RIVETING, PLAIN EYE.**

Nos.	Weight	Per Dozen	Nos.	Weight	Per Dozen
0	4 oz.	\$5.50	4	15 oz.	\$6.50
1	7 oz.	5.75	5	1 lb. 2 oz.	7.00
2	9 oz.	6.00	6	1 lb. 6 oz.	7.50
3	12 oz.	6.25	7	1 lb. 10 oz.	8.00

WRITE FOR DISCOUNTS.

HOLLOW HAND PUNCHES.

For Tin, Copper, Zinc, Lead, and Sheet Iron Work.



The construction of these Punches should commend itself to all; the scientific concave cutting edge and the process of tempering are just the opposite of all other punches made. Try this Punch and be convinced that it is far superior to any; that it will save you time and money by being a perfect made Punch, suitable for high grade, as well as heavy work. These Hollow Hand Punches are the only punches that will stand up when 16 gauge iron or other metal is used without splitting the metal when holes are punched close together. We ask that you give them a trial.

Our Standard Set of Hollow Hand Punches are from $\frac{1}{2}$ to $1\frac{1}{2}$ inches, varying $\frac{1}{8}$ inch in diameter. Other sizes made to order.

List Prices.

Standard Complete Set, including $\frac{1}{2}$ -in., $\frac{5}{8}$ -in., $\frac{3}{4}$ -in., $\frac{7}{8}$ -in., 1-in., $1\frac{1}{8}$ -in., $1\frac{1}{4}$ -in., $1\frac{3}{8}$ -in. and $1\frac{1}{2}$ -in. punches.....\$15.00

SINGLE PUNCHES.

Size	Price	Size	Price	Size	Price
$\frac{1}{2}$ in.	\$1.00	$\frac{7}{8}$ in.	\$1.75	$1\frac{1}{4}$ in.	\$2.50
$\frac{5}{8}$ in.	1.25	1 in.	2.00	$1\frac{3}{8}$ in.	2.75
$\frac{3}{4}$ in.	1.50	$1\frac{1}{8}$ in.	2.25	$1\frac{1}{2}$ in.	3.00

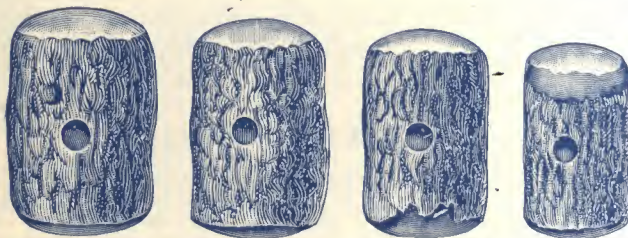
WRITE FOR DISCOUNTS.

BOILERMAKERS' HAMMER HANDLES.

Made of best selected second growth hickory.

Each stick we carry in stock is made expressly for the particular purpose for which it is sold.

SIZES CARRIED IN STOCK.			Price per Dozen.
12 in.	Chipping Handles.....		\$0.65
14	"		.80
16	"		.95
18	Riveting		.95
20	"		1.10
22	"		1.10
24	"		1.30
26	Blacksmith's		1.30
28	"		1.50
30	Sledge	light, medium or heavy.....	1.75
36	"		2.00
48	"		3.00
24	Tool		.50
30	"		.75
36	"		.85
30	Maul		1.50
36	"		2.00

BARK COVERED MAULS.

Made of special selected grub hickory.

SIZES CARRIED IN STOCK.			Price Each
3 in. dia.	x 6 n. long.		\$0.35
3½	x 7		.35
4	x 8		.45
4½	x 9		.55
5	x 10		.75
6	x 10		.85
6	x 12		.85
7	x 11		1.10
8	x 12		1.30
9	x 12		1.60

WRITE FOR DISCOUNTS.

TURNED HANDLES. TURNED HICKORY PICK HANDLES.

Surface or R. R., Mattock, and Miners'.		Extra	Exclr	No. 1	No. 2	No. A
Pick	Handles—Surface or R. R., 36 inch....per doz.	\$11.50	\$9.10	\$7.70	\$4.40	\$3.70
"	Drifting, 32, 34 and 36 inch.. "	9.80	5.80	4.90	....	....
"	Poll, 32, 34 and 36 inch..... "	9.80	5.80	4.90	....	....
"	Coal Miners' Small Eye, 3x $\frac{5}{8}$, 34 "	7.90	6.20	3.60	....	....
"	" Medium Eye, 3x $\frac{3}{4}$, 34 "	7.90	6.20	3.60	....	....
"	" Large Eye, 3 $\frac{1}{2}$ x $\frac{1}{2}$, 34 "	7.90	6.20	3.60	....	....

HAND SHAVED PICK, ADD 80 CENTS PER DOZEN TO ABOVE PRICES.

TURNED SLEDGE TOOL AND MAUL HANDLES.

Length.....	24 in.	26&28 inch.	30&32 inch.	34&36 inch.	38 in.	40 in.	42 in.
Extra.....per doz.	\$4.00	\$5.00	\$5.60	\$6.70	\$7.20	\$7.80	\$8.40
No. 1....."	2.80	3.20	3.70	4.60	4.80	5.00	5.60
No. 2....."	1.80	2.20	2.50	2.80	3.00	3.70	4.30

HAND SHAVED SLEDGE, ADD 60 CENTS PER DOZEN TO ABOVE PRICES.

TURNED HAMMER AND HATCHET HANDLES.

Length.....	11	12	13	14	15	16	17	18	19	20	22	24 in.
Machinists' Hammer, per doz.	\$1.60	\$1.60	\$1.60	\$1.60	\$1.60	\$1.75	\$1.75	\$2.00	\$2.25	\$2.25	\$2.50	\$2.80
Blacksmiths' Hammer, per doz.	1.60	1.60	1.60	1.60	1.60	1.75	1.75	2.00	2.25	2.25	2.50	2.80
Riveting Hammer, per doz.	1.60	1.60	1.60	1.60	1.60	1.75	1.75	2.00	2.25	2.25	2.50	2.80
Hammer, A. E. & R. E., per doz. ....	....	1.60	1.60	1.70	1.70	....	....	....	....	....	....	....

SOFT WOOD FILE HANDLES.

WITH BRASS FERRULE.

Nos.....	1	2	3	50
For Files,	Ex. Large.	Large.	Medium.	Assorted.
Per dozen,	\$0.67	\$0.60	\$0.50	\$0.60

"THE BEST" FILE HANDLE.



The ferrule is made of No. 20 pressed steel. The groove in the ferrule fits that in the wood part in such a manner that when the file tang is driven in, it expands the wood and makes ferrule, wood and file, as solid as though cast together.

ONE of these "Best" handles out lasts SIX common ones.

No injury from split handles; no "wobble" of file when at work; no time lost by workmen having to stop to fix file handle; and the price is not excessively high.

No. 1.	\$1.10 per dozen, or \$13.00 per gross.	No. 1 fits from	4" to 6" files.
No. 2.	1.30 " " " 14.00 " "	No. 2 " "	5" " 10" "
No. 3.	1.50 " " " 15.00 " "	No. 3 " "	12" " 20" "

WRITE FOR DISCOUNTS.

FORGED STEEL SCREW PUNCHES.

Fig. 1

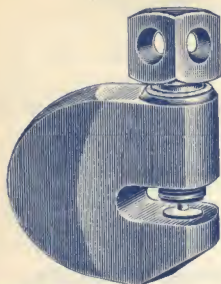


Fig. 2

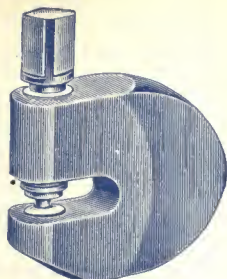
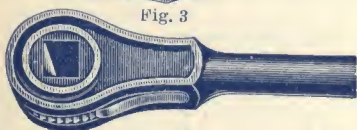


Fig. 3



Made especially for Boilermakers and others requiring a strong, substantial tool. Have large screws carefully fitted with hardened bearing cap for punch.

This ratchet handle (Fig. 3) used on ratchet punch (Fig. 2) is a great time saver.

In ordering mention size of hole to be punched.
LIST PRICES.

Size	Will Punch		Depth of Throat	Weight	List Price inc. 1 punch and die	Extra Punch	Extra Die
	Hole	Thick					
No. 0	3-8 in.	1-8 in.	1 1-2 in.	5 lbs.	\$12.00	\$0.80	\$1.00
1	1-2	5-16	1 1-2	20	16.00	.90	1.20
2	5-8	5-8	2 1-2	48	25.00	1.20	1.40
3	3-4	3-4	3 1-4	70	32.00	1.50	1.60
4	3-4	3-4	4	100	40.00	1.50	1.60

Ratchet Handle, fits Nos. 1, 2, 3 and 4\$14.00

CAST STEEL SCREW PUNCHES.**LIST PRICES.**

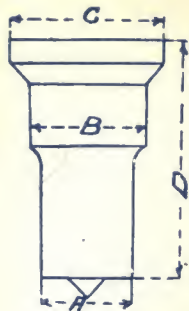
Size	Will Punch		Depth of Throat	Weight	List Price inc. 1 punch and die	Extra P'nch	Extra Die
	Hole in.	Thick in.					
A	$\frac{5}{16}$	$\frac{1}{4}$	$1\frac{1}{2}$	15	\$20.00	\$2.10	\$1.40
B	$\frac{1}{2}$	$\frac{1}{4}$	$1\frac{1}{2}$	17	24.00	2.10	1.40
C	$\frac{1}{2}$	$\frac{5}{16}$	$1\frac{1}{2}$	27	30.00	2.40	1.60
D	$\frac{3}{4}$	$\frac{1}{2}$	$2\frac{1}{4}$	40	40.00	2.40	1.60
E	$\frac{3}{4}$	$\frac{3}{4}$	3	60	60.00	3.00	2.00
G	$\frac{3}{4}$	$\frac{3}{4}$	4	110	80.00	3.00	2.00

List price on Screw Punches includes one punch and die.
Depth of throat is distance from center of punch.

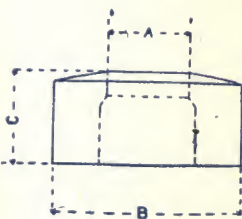
All sizes carried in stock.

In ordering mention size of hole to be punched.

WRITE FOR DISCOUNTS.

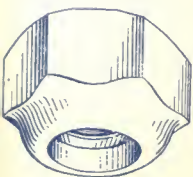
PUNCHES, DIES AND COUPLINGS.**STANDARD PUNCHES.**

No. of Punch.	Price Each.	DIMENSIONS.			
		A	B	C	D
2	\$0.38	$\frac{1}{8}$ to $\frac{3}{8}$	$\frac{1}{32}$ to $\frac{9}{16}$	$\frac{17}{32}$ to $\frac{29}{32}$	$\frac{1}{32}$ to $\frac{15}{32}$
3	.50	$\frac{1}{8}$ to $\frac{9}{16}$	$\frac{1}{32}$ to $\frac{25}{32}$	$\frac{29}{32}$ to $\frac{1}{2}$	$\frac{1}{16}$ to $\frac{3}{8}$
4	.75	$\frac{1}{4}$ to $\frac{13}{16}$	$\frac{1}{32}$ to $\frac{1}{2}$	$\frac{1}{2}$ to $\frac{15}{16}$	$\frac{1}{16}$ to $\frac{1}{2}$
5	1.08	$\frac{3}{8}$ to 1	$\frac{1}{32}$ to 1	1 to $1\frac{15}{16}$	$\frac{1}{16}$ to 1
6	1.50	$\frac{9}{16}$ to $1\frac{1}{4}$	$\frac{1}{32}$ to $1\frac{1}{4}$	$1\frac{1}{8}$ to $2\frac{3}{8}$	$\frac{1}{16}$ to $1\frac{1}{2}$
7	2.00	$\frac{11}{16}$ to $1\frac{9}{16}$	$\frac{1}{32}$ to $1\frac{17}{32}$	$1\frac{11}{16}$ to $2\frac{1}{2}$	$\frac{1}{16}$ to $1\frac{1}{2}$
8	3.00	1 to $1\frac{3}{4}$	$\frac{1}{32}$ to $2\frac{1}{8}$	$2\frac{1}{16}$ to 3	$\frac{1}{16}$ to 2
9	5.00	$1\frac{1}{2}$ to $2\frac{1}{4}$	$\frac{1}{32}$ to $2\frac{9}{32}$	$2\frac{9}{16}$ to $3\frac{1}{2}$	$\frac{1}{16}$ to 3
10	6.50	2 to $2\frac{3}{8}$	$\frac{1}{32}$ to $2\frac{21}{32}$	$2\frac{31}{32}$ to 4	$\frac{1}{16}$ to 3

STANDARD DIES.

No. of Die.	Price Each.	DIMENSIONS.		
		A	B	C
2	\$0.75	$\frac{1}{8}$ to $\frac{5}{16}$	$\frac{3}{4}$	$\frac{5}{8}$ to $\frac{3}{4}$
3	1.00	$\frac{1}{8}$ to $\frac{9}{16}$	1	$\frac{1}{2}$ to $\frac{3}{4}$
4	1.50	$\frac{1}{4}$ to $\frac{3}{4}$	$1\frac{1}{2}$	1 to $1\frac{1}{8}$
4-W	1.70	$\frac{1}{4}$ to $\frac{3}{4}$	$1\frac{11}{16}$	$1\frac{1}{8}$ to $1\frac{1}{2}$
4-C	1.85	$\frac{1}{4}$ to $\frac{3}{4}$	$1\frac{11}{16}$	$1\frac{1}{8}$ to $1\frac{1}{2}$
5	2.00	$\frac{3}{8}$ to 1	2	$1\frac{1}{8}$ to $1\frac{1}{2}$
5-C	2.10	$\frac{3}{8}$ to 1	2	$1\frac{1}{8}$ to $1\frac{1}{2}$
5-W	2.40	$\frac{1}{2}$ to $1\frac{1}{8}$	$2\frac{3}{16}$	$1\frac{1}{4}$ to $1\frac{1}{2}$
6	2.50	$\frac{1}{2}$ to $1\frac{1}{4}$	$2\frac{3}{8}$	$1\frac{1}{4}$ to $1\frac{1}{2}$
6-W	4.00	$\frac{1}{2}$ to $1\frac{7}{8}$	$2\frac{11}{16}$	$1\frac{1}{2}$ to $1\frac{3}{4}$
7	4.50	$\frac{3}{4}$ to $1\frac{9}{16}$	$2\frac{7}{8}$	$1\frac{3}{4}$ to 2
7-H	4.65	$\frac{3}{4}$ to $1\frac{9}{16}$	$2\frac{15}{16}$	$1\frac{3}{4}$ to 2

Punches and dies made of high grade tool steel and guaranteed.
Standard sizes carried in stock for immediate shipment.
In ordering mention size of hole to be punched.

STANDARD COUPLINGS.

No. of Coupling.	Price Each.	Diameter of Thread, Inches.	Largest Outside Diam. of Coupling, Inches.	Plain Hole, Inches.
2	\$1.00	$\frac{11}{16}$	$1\frac{9}{32}$	$\frac{7}{16}$
3	1.25	$\frac{7}{8}$	$1\frac{11}{16}$	$\frac{3}{8}$
4	1.50	$1\frac{1}{16}$	$1\frac{13}{16}$	$\frac{13}{16}$
5	1.75	$1\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{1}{16}$
6	2.00	$1\frac{9}{16}$	$2\frac{3}{8}$	$1\frac{1}{4}$
7	2.50	$1\frac{7}{8}$	$2\frac{15}{16}$	$1\frac{9}{16}$
8	3.25	$2\frac{1}{4}$	$3\frac{1}{2}$	$1\frac{13}{16}$
9	4.00	$2\frac{3}{4}$	$4\frac{3}{8}$	$2\frac{5}{16}$
10	4.75	$3\frac{1}{4}$	$4\frac{7}{8}$	$2\frac{11}{16}$
11	5.50	$3\frac{7}{8}$	$5\frac{3}{4}$	$3\frac{5}{16}$
12	6.00	$4\frac{7}{8}$	$7\frac{1}{16}$	$4\frac{3}{16}$

WRITE FOR DISCOUNTS.



**"PERFECT
HANDLE"
WRENCH.
IN STOCK.**

**DROP-FORGED SCREW WRENCH.
STRONGEST, MOST PRACTICAL, MOST COMFORTABLE.**

Length Inches	Jaw Opening Inches	List Price Per Dozen	Length Inches	Jaw Opening Inches	List Price Per Dozen
6	1 $\frac{1}{16}$	\$ 9.00	15	2 $\frac{3}{4}$	\$24.00
8	1 $\frac{1}{4}$	10.00	18	3 $\frac{1}{8}$	30.00
10	1 $\frac{7}{8}$	12.00	21	4	36.00
12	2 $\frac{3}{16}$	14.00			



**AGRICULTURAL
WRENCH,
WROUGHT
BAR.
IN STOCK.**

Length Inches	Per Dozen Black	Per Dozen Bright	Length Inches	Per Dozen Black	Per Dozen Bright
6	\$10.00	\$11.00	12	\$17.00	\$19.00
8	12.00	14.00	15	24.00	27.00
10	14.00	16.00			



**STILLSON PIPE
WRENCH.
IN STOCK.**

Length Inches	Takes Pipe Inches	Price Each	Length Inches	Takes Pipe Inches	Price Each
6	$\frac{1}{8}$ to $\frac{1}{2}$	\$2.00	18	$\frac{1}{4}$ to 2	\$ 4.00
8	$\frac{1}{8}$ to $\frac{3}{4}$	2.00	24	$\frac{1}{4}$ to 2 $\frac{1}{2}$	6.00
10	$\frac{1}{8}$ to 1	2.25	36	$\frac{1}{4}$ to 3 $\frac{1}{2}$	12.00
14	$\frac{1}{4}$ to 1 $\frac{1}{2}$	3.00	48	1 to 5	18.00

**WRIGHT
WRENCH.
IN STOCK.**



Press the thumb to adjust instantly to any size nut.

A time saver, a labor saver, simplicity, easy adjustment.

Our bar is made of 20 carbon open hearth drop forged steel, carbonized, mottled and hardened. Our jaw of semi-steel carbonized, mottled and hardened. Rack and Pawl, tool steel car-

bonized, mottled and hardened. Spring steel wire, oil tempered. Screw, case hardened. All wrenches milled, ground and polished before mottled, which is the best finish known to mechanical science, to resist rust, and far superior to the bright finish.

6 in.	8 in.	10 in.	12 in.	15 in.	18 in.
Per dozen, \$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00
Automobile, per dozen, 8 in., \$12.00; 10 $\frac{1}{2}$ in., \$15.00.					

WRITE FOR DISCOUNTS.

DROP-FORGED WRENCHES.**IN STOCK.****CONSTRUCTION.**

Heavy head and tang. Opening, 15° angle.

Unfinished are plain forgings with openings milled to fit nut.

Semi-finished are plain forgings, milled, and case-hardened all over.

Finished are milled, ground, heads polished and case-hardened all over.

Number	For U. S. Standard Nut Size Bolt	Opening Finished	Extreme Length	Thickness Head	Price, Unfin- ished	Price, Semi- fin- ished	Price, Fin- ished
223	$\frac{3}{8}$	$\frac{11}{16}$	$9\frac{1}{2}$	$\frac{3}{8}$	\$0.20	\$0.30	\$0.40
224	$\frac{7}{16}$	$\frac{23}{32}$	$9\frac{1}{2}$	$\frac{3}{8}$	.20	.30	.40
225	$\frac{1}{2}$	$\frac{7}{8}$	$11\frac{1}{2}$	$\frac{7}{16}$	.32	.48	.64
226	$\frac{9}{16}$	$\frac{31}{32}$	$12\frac{1}{2}$	$\frac{1}{2}$	.40	.60	.80
227	$\frac{5}{8}$	$1\frac{1}{16}$	14	$\frac{9}{16}$	.50	.75	1.00
228	$\frac{3}{4}$	$1\frac{1}{4}$	16	$\frac{5}{8}$	.65	.97	1.30
229	$\frac{7}{8}$	$1\frac{7}{16}$	$17\frac{1}{2}$	$\frac{11}{16}$	.85	1.28	1.70
230	1	$1\frac{5}{8}$	19	$\frac{3}{4}$	1.10	1.65	2.20

STRUCTURAL.

Head is offset for close work and opening is parallel with handle.
Furnished unfinished and semi-finished only.

Number	For U. S. Standard Nut Size Bolt	Opening Finished	Length	Thickness Head	Price, Un- finished	Price, Semi- finished
901	$\frac{1}{4}$	$\frac{17}{32}$	8	$\frac{3}{8}$	\$0.16	\$0.24
902	$\frac{5}{16}$	$\frac{5}{8}$	8	$\frac{3}{8}$	.16	.24
903	$\frac{3}{8}$	$\frac{23}{32}$	$9\frac{1}{2}$	$\frac{13}{32}$	.20	.30
904	$\frac{7}{16}$	$\frac{13}{16}$	$9\frac{1}{2}$	$\frac{13}{32}$	.20	.30
905	$\frac{1}{2}$	$\frac{29}{32}$	$11\frac{1}{2}$	$\frac{15}{32}$	.32	.48
906	$\frac{9}{16}$	1	$12\frac{3}{4}$	$\frac{9}{16}$	.40	.60
907	$\frac{5}{8}$	$1\frac{7}{16}$	$14\frac{1}{8}$	$\frac{5}{8}$	.50	.75
908	$\frac{3}{4}$	$1\frac{13}{16}$	16	$\frac{11}{16}$	.65	.97
909	$\frac{7}{8}$	$1\frac{1}{2}$	$17\frac{1}{2}$	$\frac{3}{4}$	.85	1.28
910	1	$1\frac{11}{16}$	19	$\frac{13}{16}$	1.10	1.65

WRITE FOR DISCOUNTS.

PARMELEE GIRDLE PIPE WRENCH.**IN STOCK.**

This wrench has no teeth. It has a quicker and firmer hold with its friction grip. The harder you pull, the tighter it grips. It will make or break the tightest steam or ammonia joint without marring or crushing the pipe; remove the most stubborn close nipple without injuring the threads; or operate in coil or other close quarters where space between pipe and stroke of handle is limited, gripping and releasing instantly, without falling from the pipe.

Length of Handles Inches	Size Number of Set	Sizes of Pipe Handled Inches	Price per Set Complete in Case	Extra Handles Price Each	Extra Girths Price Each
10 inches	1	$\frac{3}{8}$ to 1 in.	\$5.00	\$2.25	$\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{3}{4}$ " 1" \$0.75
20 inches	2 $\frac{1}{2}$	$\frac{3}{4}$ to 2 in.	7.50	2.50	$\frac{3}{4}$ " 1" $1\frac{1}{4}$ " $1\frac{1}{2}$ " \$1.25
25 inches	3 $\frac{1}{2}$	$1\frac{1}{2}$ to 3 in.	7.50	3.00	$1\frac{1}{2}$ " 2" $2\frac{1}{2}$ " 3" \$1.25

All parts interchangeable. Each wrench boxed when ordered complete. All sizes carried in stock for immediate shipment.

PARMELEE DRILL AND NUT SOCKETS.

**FOR USE WITH 1 INCH No. 1
PARMELEE WRENCH.
IN STOCK.**

This combination makes a perfect ratchet drill without teeth. Will work one-third faster than ratchet drill because there is no slipping from tooth to tooth in going back. The operator gets the full value of the pull. Particularly adapted to work in places inaccessible to ratchet drills. Will send on trial—guaranteed to work to your entire satisfaction.

LIST PRICES.

No. 2 Boilermakers' Socket, complete with 10" handle and 1" girth.....	\$6.00
No. 2 General Use Socket, complete with 10" handle and 1" girth.....	7.75
No. 2 Morse Taper Socket, complete with 10" handle and 1" girth.....	9.25
Nut Socket, complete with 10" handle and 1" girth.....	4.00
Boilermakers' Socket only.....	3.00
General Use Socket only.....	4.75
Morse Taper Socket only.....	6.25
Nut Socket only.....	1.00

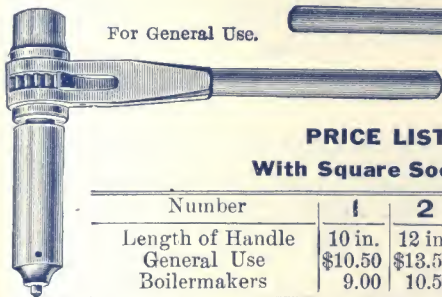
WRITE FOR DISCOUNTS.

PACKER RATCHETS.**IN STOCK.**

For Boilermakers.



For General Use.

**PRICE LIST.****With Square Sockets.**

Number	1	2	3	4	5
Length of Handle	10 in.	12 in.	16 in.	18 in.	24 in.
General Use	\$10.50	\$13.50	\$16.00	\$19.00	\$23.00
Boilermakers	9.00	10.50	.....	.....	.....

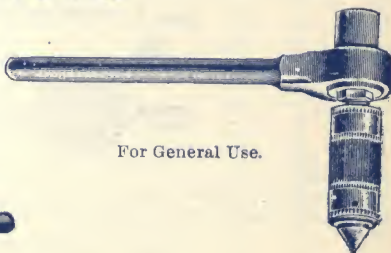
With Morse Taper Sockets.

Number	1	2	3	4
Length of Handle	10 in.	13 in.	16 in.	18 in.
Morse Taper	No. 1	No. 2	No. 3	No. 4
List Price	\$13.00	\$16.00	\$20.00	\$25.00

All sizes in both kinds always in stock.

PARKER RATCHET DRILLS.**IN STOCK.**

For General Use.



For Boilermakers' Use.



Number	4	5	6	6½	7	8	9
Length of Handle	10 in.	12 in.	15 in.	17 in.	20 in.	10 in.	12 in.
General Use	\$5.75	\$6.00	\$7.00	\$7.50	\$8.00	.....	.....
Boilermakers	.....	.....	.....	.....	.....	\$5.50	\$6.00

WRITE FOR DISCOUNTS.

BREAST DRILLS.**No. 1 FRAY'S.**

Price, each\$5.00
 Double geared, alligator forged steel jaws, ball bearing shoulder; parts fully nickeled.

No. 2 FRAY'S.

Price, each\$4.00
 Furnished with change of speed for light and heavy work; ball bearing shoulder, alligator forged steel jaws, cut gears, frame malleable iron.

No. 12 BREAST DRILL.

Price, each\$2.50
 Five inch drive wheel, cut gears, adjustable crank, level attachment, nickel chuck, changeable gear, ball bearing, alligator jaws.

No. 13 BREAST DRILL.

Price, each\$4.00
 Six inch drive wheel, cut gears, double geared, adjustable crank, level attachment, nickel chuck, changeable gear, ball bearing, alligator jaws.

No. 5 HAND DRILL.

With 8 points in hollow handle, each\$1.50
 With side handle, double geared, nickel chuck, three jaws.

WRITE FOR DISCOUNTS.

FLAT TWISTED HIGH SPEED TWIST DRILLS.



FLAT TWISTED.



FLAT.

Made of highest grade of high speed steel, tempered and fitted with standard taper or straight shank. Need no special, expensive chuck. They are cheaper, stronger and better than the ordinary high speed drills. The "flat" and "short flat" drills are ten per cent to twenty per cent cheaper than the "flat twisted" drills. Give them a trial.

LIST PRICES.

Size Inches	Length Inches	Price Each	Size Inches	Length Inches	Price Each	Size Inches	Length Inches	Price Each
$\frac{1}{4}$	6 $\frac{1}{2}$	\$0.80	$1\frac{1}{8}$	12	\$ 6.55	$2\frac{1}{8}$	17	\$20.80
$\frac{5}{16}$	6 $\frac{1}{2}$	.85	$1\frac{1}{4}$	12 $\frac{1}{2}$	6.90	$2\frac{3}{8}$	17	21.50
$\frac{3}{8}$	6 $\frac{1}{2}$	.90	$1\frac{1}{2}$	12 $\frac{1}{2}$	7.20	$2\frac{1}{2}$	17	22.20
$\frac{7}{16}$	6 $\frac{1}{2}$	.95	$1\frac{3}{4}$	14 $\frac{1}{2}$	7.60	$2\frac{3}{4}$	17 $\frac{1}{2}$	22.90
$\frac{1}{2}$	6 $\frac{1}{2}$	1.05	$1\frac{7}{8}$	14 $\frac{1}{2}$	8.00	$2\frac{1}{2}$	17 $\frac{1}{2}$	23.60
$\frac{9}{16}$	7	1.10	$1\frac{1}{2}$	14 $\frac{1}{2}$	8.40	$2\frac{3}{8}$	17 $\frac{1}{2}$	24.30
$\frac{5}{8}$	7 $\frac{1}{2}$	1.15	$1\frac{1}{2}$	14 $\frac{1}{2}$	8.80	$2\frac{1}{2}$	17 $\frac{1}{2}$	25.00
$\frac{3}{4}$	7 $\frac{1}{2}$	1.20	$1\frac{3}{4}$	14 $\frac{1}{2}$	9.20	$2\frac{3}{8}$	18	25.70
$\frac{7}{8}$	7 $\frac{1}{2}$	1.30	$1\frac{7}{8}$	14 $\frac{1}{2}$	9.60	$2\frac{1}{2}$	18	26.40
8	8	1.40	$1\frac{1}{2}$	14 $\frac{1}{2}$	10.00	$2\frac{3}{8}$	18 $\frac{1}{2}$	27.10
$8\frac{1}{2}$	8 $\frac{1}{2}$	1.50	$1\frac{1}{2}$	15	10.40	$2\frac{1}{2}$	18 $\frac{1}{2}$	27.80
$8\frac{1}{2}$	8 $\frac{1}{2}$	1.60	$1\frac{1}{2}$	15 $\frac{1}{2}$	10.80	$2\frac{3}{8}$	19	28.50
$8\frac{1}{2}$	8 $\frac{1}{2}$	1.75	$1\frac{3}{4}$	15 $\frac{1}{2}$	11.20	$2\frac{1}{2}$	19	29.20
9	9	1.90	$1\frac{1}{2}$	15 $\frac{1}{2}$	11.65	$2\frac{3}{8}$	19 $\frac{1}{2}$	29.90
$9\frac{1}{2}$	9 $\frac{1}{2}$	2.05	$1\frac{1}{2}$	15 $\frac{1}{2}$	12.10	$2\frac{1}{2}$	19 $\frac{1}{2}$	30.60
$9\frac{1}{2}$	9 $\frac{1}{2}$	2.25	$1\frac{3}{4}$	15 $\frac{1}{2}$	12.60	$2\frac{3}{8}$	19 $\frac{1}{2}$	31.30
$9\frac{1}{2}$	9 $\frac{1}{2}$	2.40	$1\frac{1}{2}$	15 $\frac{1}{2}$	13.05	$2\frac{1}{2}$	19 $\frac{1}{2}$	32.00
$9\frac{1}{2}$	9 $\frac{1}{2}$	2.60	$1\frac{3}{4}$	15 $\frac{1}{2}$	13.60	$2\frac{3}{8}$	20	33.00
10	10	2.80	$1\frac{1}{2}$	16	14.10	$2\frac{1}{2}$	20	34.00
$10\frac{1}{2}$	10 $\frac{1}{2}$	3.00	$1\frac{3}{4}$	16 $\frac{1}{2}$	14.55	$2\frac{3}{8}$	20 $\frac{1}{2}$	35.00
$10\frac{1}{2}$	10 $\frac{1}{2}$	3.20	$1\frac{1}{2}$	16 $\frac{1}{2}$	15.00	$2\frac{1}{2}$	20 $\frac{1}{2}$	36.00
$10\frac{1}{2}$	10 $\frac{1}{2}$	3.45	$1\frac{3}{4}$	16 $\frac{1}{2}$	15.50	$2\frac{3}{8}$	20 $\frac{1}{2}$	37.00
$10\frac{1}{2}$	10 $\frac{1}{2}$	3.75	$1\frac{1}{2}$	16 $\frac{1}{2}$	16.00	$2\frac{1}{2}$	20 $\frac{1}{2}$	38.00
$10\frac{1}{2}$	10 $\frac{1}{2}$	4.05	$1\frac{3}{4}$	16 $\frac{1}{2}$	16.55	$2\frac{3}{8}$	21	39.00
11	11	4.35	$1\frac{1}{2}$	16 $\frac{1}{2}$	17.10	$2\frac{1}{2}$	21	40.00
$11\frac{1}{2}$	11 $\frac{1}{2}$	4.75	$1\frac{3}{4}$	16 $\frac{1}{2}$	17.65	$2\frac{3}{8}$	21	41.25
$11\frac{1}{2}$	11 $\frac{1}{2}$	5.10	2	16 $\frac{1}{2}$	18.20	$2\frac{1}{2}$	21	42.50
$11\frac{1}{2}$	11 $\frac{1}{2}$	5.45	$2\frac{1}{8}$	16 $\frac{1}{2}$	18.85	$2\frac{3}{8}$	22	43.75
$11\frac{1}{2}$	11 $\frac{1}{2}$	5.80	$2\frac{1}{4}$	17	19.50	$2\frac{1}{2}$	22	45.00
$11\frac{1}{2}$	11 $\frac{1}{2}$	6.20	$2\frac{3}{8}$	17	20.15			

We also carry standard grooved high-speed drills.

WRITE FOR DISCOUNTS.

STRAIGHT SHANK TWIST DRILLS.



IN STOCK.

REGULAR LENGTHS.				SHORT LENGTHS.			
We carry all sizes in stock.				We carry all sizes in stock.			
Dia. in inches.	Length over all in inches.	PRICE each.		Dia. in inches.	Length over all in inches.	PRICE each.	
1-8	5	\$0.45		27-32	10 1/2	\$2.30	
9-64	5 1/2	.45		55-64	10 1/2	2.45	
5-32	5 1/2	.45		7-8	10 1/2	2.45	
11-64	5 1/2	.50		57-64	10 1/2	2.60	
3-16	5 1/2	.50		29-32	10 1/2	2.60	
13-64	5 1/2	.55		59-64	10 1/2	2.75	
7-32	5 1/2	.55		15-16	10 1/2	2.75	
15-64	6	.60		61-64	10 1/2	2.90	
1-4	6 1/2	.60		31-32	10 7/8	2.90	
17-64	6 1/2	.65		63-64	11	3.00	
9-32	6 1/2	.65		1	11	3.00	
19-64	6 1/2	.70		1 1/4	11 1/4	3.20	
5-16	6 3/4	.70		1 1/2	11 1/2	3.20	
21-64	6 3/4	.75		1 3/4	11 3/4	3.40	
11-32	6 3/4	.75		1 7/8	11 7/8	3.40	
23-64	6 3/4	.80		1 1/2	11 1/2	3.60	
3-8	6 3/4	.80		1 3/4	11 3/4	3.60	
25-64	7	.85		1 7/8	11 7/8	3.80	
13-32	7 1/4	.85		1 1/2	11 1/2	3.80	
27-64	7 1/4	.90		1 3/4	11 3/4	4.00	
7-16	7 1/4	.90		1 7/8	11 7/8	4.00	
29-64	7 1/4	.95		1 1/2	12	4.20	
15-32	7 1/4	.95		1 3/4	12	4.20	
31-64	7 1/4	1.00		1 7/8	12	4.40	
1-2	7 1/4	1.00		1 1/2	12 1/2	4.40	
33-64	8	1.10		1 3/4	12 1/2	4.40	
17-32	8 1/4	1.10		1 7/8	12 1/2	4.50	
35-64	8 1/4	1.20		1 1/2	12 1/2	4.50	
9-16	8 1/4	1.20		1 3/4	14 1/4	4.65	
37-64	8 1/4	1.30		1 7/8	14 1/4	4.65	
19-32	8 1/4	1.30		1 1/2	14 1/4	4.80	
39-64	8 1/4	1.40		1 3/4	14 1/4	5.00	
5-8	8 1/4	1.40		1 7/8	14 1/4	5.00	
41-64	9	1.50		1 1/2	14 1/4	5.20	
21-32	9	1.50		1 3/4	14 1/4	5.20	
43-64	9 1/4	1.60		1 7/8	14 1/4	5.40	
11-16	9 1/4	1.60		1 1/2	14 1/4	5.40	
45-64	9 1/4	1.70		1 3/4	14 1/4	5.60	
23-32	9 1/4	1.70		1 7/8	14 1/4	5.60	
47-64	9 1/4	1.85		1 1/2	14 1/4	5.80	
3-4	9 1/4	1.85		1 3/4	14 1/4	5.80	
49-64	9 1/4	2.00		1 7/8	15	6.00	
25-32	9 1/4	2.00		1 1/2	15	6.00	
51-64	10	2.15					
13-16	10	2.15					
53-64	10 1/4	2.30					

STEEL SLEEVES FOR TAPER SHANK DRILLS.

No. 1 fitted to No. 2	or 3 Morse Taper Socket.....	\$1.80
2	3 Morse Taper Socket	2.40
3	4	3.00
4	5	4.40

WRITE FOR DISCOUNTS.

TAPER SHANK TWIST DRILLS.



IN STOCK.

We carry these sizes in stock.

Dia. in In.	Length over all in In.	PRICE each.	Socket for Morse Taper
1-8	5	\$0.45	No. 1.
9-64	5	.45	
5-32	5	.45	
11-64	5	.50	
3-16	5	.50	
13-64	5	.55	
7-32	5	.55	
15-64	6	.60	
1-4	6	.60	
17-64	6	.65	
9-32	6	.65	No. 2.
19-64	6	.70	
5-16	6	.70	
21-64	6	.75	
11-32	6	.75	
23-64	6	.80	
3-8	6	.80	
25-64	6	.85	
13-32	7	.85	
27-64	7	.90	
7-16	7	.90	No. 3.
29-64	7	.95	
15-32	7	.95	
31-64	7	1.00	
1-2	7	1.00	
33-64	8	1.10	
17-32	8	1.10	
35-64	8	1.20	
9-16	8	1.20	
37-64	8	1.30	
19-32	8	1.30	No. 4.
39-64	8	1.40	
5-8	8	1.40	
41-64	9	1.50	
21-32	9	1.50	
43-64	9	1.60	
11-16	9	1.60	
45-64	9	1.70	
23-32	9	1.70	
47-64	9	1.85	
3-4	9	1.85	

We carry these sizes in stock.

Dia. in In.	Length over all in In.	PRICE each.	Socket for Morse Taper
49-64	9	\$2.00	No. 2.
25-32	9	2.00	
51-64	10	2.15	
13-16	10	2.15	
53-64	10	2.30	
27-32	10	2.30	
55-64	10	2.45	
7-8	10	2.45	
57-64	10	2.60	
29-32	10	2.60	No. 3.
59-64	10	2.75	
15-16	10	2.75	
61-64	10	2.90	
31-32	10	2.90	
63-64	11	3.00	
1	11	3.00	
1	11	3.20	
1	11	3.20	
1	11	3.40	
1	11	3.40	No. 4.
1	11	3.60	
1	11	3.60	
1	11	3.80	
1	11	3.80	
1	11	4.00	
1	11	4.00	
1	12	4.20	
1	12	4.20	
1	12	4.40	
1	12	4.40	No. 5.
1	12	4.50	
1	12	4.50	
1	14	4.65	
1	14	4.65	
1	14	4.80	
1	14	4.80	
1	14	5.00	
1	14	5.00	
1	14	5.20	
1	14	5.20	

We carry these sizes in stock.

Dia. in In.	Length over all in In.	PRICE each.	Socket for Morse Taper
1	14	\$5.40	No. 4.
1	14	5.60	
1	14	5.60	
1	14	5.80	
1	14	5.80	
1	15	6.00	
1	15	6.00	
1	15	6.30	
1	15	6.60	
1	15	6.90	
1	15	7.20	No. 5.
1	15	7.50	
1	15	7.80	
1	16	8.10	
1	16	8.40	
1	16	8.60	
1	16	8.80	
1	16	9.00	
1	16	9.20	
1	16	9.35	
1	16	9.50	No. 6.
1	16	9.65	
1	16	9.80	
1	16	10.20	
1	17	10.60	
1	17	11.20	
1	17	12.00	
1	17	12.80	
1	17	13.60	
1	18	14.40	
1	18	15.00	No. 7.
1	19	15.60	
1	19	16.20	
1	19	16.80	
1	20	17.60	
1	20	19.00	
1	20	20.00	
1	21	21.00	
1	21	23.00	
1	22	25.00	

STRAIGHT SHANK STEEL SOCKET FOR TAPER SHANK DRILLS.

Size.	Length over all.	Dia. of Blank End	PRICE each.
No. 1. Holds 1 to 1 in. drills, inclusive	7 in.	1 1/2 in.	\$1.20
2.	8	1 3/4	1.80
3.	10	1 7/8	2.50
4.	13	2	4.00
5.	15	2 1/8	7.50

TAPER SHANK STEEL SOCKET FOR TAPER SHANK DRILLS.

No. 1 with Shank fitted to No. 2 or 3 Morse Taper Socket....	\$2.00 each.
3 Morse Taper Socket.....	2.50
4	3.20
4	4.80

WRITE FOR DISCOUNTS.

TAPER SQUARE SHANK DRILLS.

For Ratchets.



These drills have shanks $\frac{3}{8}$ in. x $\frac{3}{8}$ in. and $1\frac{1}{2}$ inches long.

We carry these sizes in stock.	Dia. Inches	Length overall Inches	PRICE each	We carry these sizes in stock.	Dia. Inches	Length overall Inches	PRICE each	We carry these sizes in stock.	Dia. Inches	Length overall Inches	PRICE each
	1-4	5	\$1.00		11-16	6 $\frac{1}{2}$	\$1.45		1 $\frac{1}{2}$	9	\$3.10
	9-32	5	1.05		23-32	6 $\frac{1}{2}$	1.50		1 $\frac{1}{2}$	9	3.25
	5-16	5	1.10		3-4	6 $\frac{1}{2}$	1.55		1 $\frac{1}{2}$	9	3.35
	11-32	5	1.15		25-32	6 $\frac{1}{2}$	1.65		1 $\frac{1}{2}$	9	3.50
	3-8	6	1.20		13-16	7	1.75		1 $\frac{1}{2}$	9 $\frac{1}{2}$	3.65
	13-32	6 $\frac{1}{2}$	1.25		27-32	7	1.90		1 $\frac{1}{2}$	9 $\frac{1}{2}$	3.75
	7-16	6 $\frac{1}{2}$	1.25		7-8	7 $\frac{1}{2}$	2.05		1 $\frac{1}{2}$	9 $\frac{1}{2}$	3.90
	15-32	6 $\frac{1}{2}$	1.30		29-32	7 $\frac{1}{2}$	2.15		1 $\frac{1}{2}$	9 $\frac{1}{2}$	4.05
	1-2	6 $\frac{1}{2}$	1.30		15-16	8	2.30		1 $\frac{1}{2}$	10	4.20
	17-32	6 $\frac{1}{2}$	1.35		31-32	8	2.45		1 $\frac{1}{2}$	10	4.35
	9-16	6 $\frac{1}{2}$	1.35		1	8 $\frac{1}{2}$	2.55		1 $\frac{1}{2}$	10	4.50
	19-32	6 $\frac{1}{2}$	1.40		1 $\frac{1}{2}$	8 $\frac{1}{2}$	2.70		1 $\frac{1}{2}$	10	4.65
	5-8	6 $\frac{1}{2}$	1.40		1 $\frac{3}{8}$	8 $\frac{1}{2}$	2.85		1 $\frac{1}{2}$	10	4.80
	21-32	6 $\frac{1}{2}$	1.45		1 $\frac{3}{4}$	8 $\frac{1}{2}$	3.00				

NUMBERED DRILLS.



ALL SIZES IN STOCK.

Numbers by Gauge	Length	Price per Doz.	Price Each	Numbers by Gauge	Length	Price per Doz.	Price Each
1 to 5	4	\$2.35	\$0.22	31 to 35	2 $\frac{3}{8}$	\$1.40	\$0.14
6 to 10	3 $\frac{1}{8}$	2.25	.21	36 to 40	2 $\frac{1}{2}$	1.25	.12
11 to 15	3 $\frac{1}{2}$	2.10	.20	41 to 45	2 $\frac{1}{4}$	1.10	.10
16 to 20	3 $\frac{3}{4}$	1.95	.19	46 to 60	2 $\frac{1}{2}$ to 1 $\frac{3}{4}$	.95	.09
21 to 25	3 $\frac{7}{8}$	1.75	.17	61 to 70	1 $\frac{1}{2}$	.90	.08
26 to 30	2 $\frac{1}{2}$	1.55	.15	71 to 80	1 $\frac{1}{8}$ to $\frac{3}{4}$	1.00	.9



GRAHAM DRILL CHUCKS.

For Grooved-Shank
Drills

No.	Plain Shank	Morse Shanks	Holds Drills	List Price
0	$\frac{3}{8}$ in. dia. 2 $\frac{1}{2}$ in. long	2-3	$\frac{3}{32}$ in. to $\frac{1}{4}$ in.	\$ 4.50
1	1 in. dia. 4 in. long	2-3-4	$\frac{1}{4}$ in. to $\frac{3}{4}$ in.	6.00
1 $\frac{1}{2}$	1 $\frac{1}{2}$ in. dia. 5 in. long	3-4	$\frac{1}{8}$ in. to 1 $\frac{1}{8}$ in.	10.50
2	1 $\frac{3}{8}$ in. dia. 5 in. long	3-4-5	$\frac{1}{4}$ in. to 2 $\frac{1}{2}$ in.	12.00

Reducers.

- No. 221** To be fitted in No. 2 Chuck and No. 1 $\frac{1}{2}$ Chuck, making it possible to take drills as small as $\frac{1}{4}$ inch in these chucks. List price \$1.50.
- No. 120** To be fitted in No. 1 Chuck (or No. 221 Reducer), making it possible to take drills in that chuck as small as $\frac{3}{32}$ inch. List price \$1.50.

WRITE FOR DISCOUNTS.

"USE-EM-UP" DRILL SOCKET.

**FOR USE WITH BROKEN TAPER-SHANK DRILLS
OR REAMERS.**



Just grind a flat surface on the remaining shank of the drill or reamer (time 3 minutes) and put it to work.

LIST PRICES.

Size	For Drills	Size Inside (Morse)	Size Outside (Morse)	List Price
1-2	$\frac{1}{8}$ to $\frac{19}{32}$	No. 1	No. 2	\$ 1.80
1-3	$\frac{1}{8}$ to $\frac{19}{32}$	No. 1	No. 3	2.40
1-4	$\frac{1}{8}$ to $\frac{19}{32}$	No. 1	No. 4	3.00
2-3	$\frac{3}{16}$ to $\frac{29}{32}$	No. 2	No. 3	2.40
2-4	$\frac{3}{16}$ to $\frac{29}{32}$	No. 2	No. 4	3.00
2-5	$\frac{3}{16}$ to $\frac{29}{32}$	No. 2	No. 5	4.40
3-4	$\frac{5}{16}$ to $1\frac{1}{4}$	No. 3	No. 4	3.00
3-5	$\frac{5}{16}$ to $1\frac{1}{4}$	No. 3	No. 5	4.40
4-5	$1\frac{1}{16}$ to 2	No. 4	No. 5	4.40
5-6	$2\frac{1}{32}$ to 3	No. 5	No. 6	10.00



DRILL STANDS.

No. 50—Holds Jobbers' straight shank drills, $\frac{1}{4}$ to $\frac{1}{2}$ in., stand only..... \$1.00

No. 80—Holds drills Nos. 1 to 60 .. 1.00

WRITE FOR DISCOUNTS.

MACHINISTS' HAND TAPS.



TAPER.



PLUG.



BOTTOMING.

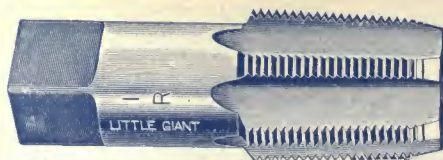
Size Inches	Price Each	No. of Threads	Size Inches	Price Each	No. of Threads
$\frac{3}{16}$	\$0.35	24, 30, 32, 36	$1\frac{1}{2}$	\$ 3.50	6
$\frac{1}{4}$	.45	20, 24, 27, 32	$1\frac{5}{8}$	4.20	5
$\frac{5}{16}$	.50	18, 20, 27, 32	$1\frac{3}{4}$	5.00	5
$\frac{3}{8}$	.55	14, 16, 18, 20, 24, 27	$1\frac{7}{8}$	5.80	4 1-2
$\frac{7}{16}$	.60	12, 14, 16, 20, 24, 27	2	6.70	4 1-2
$\frac{1}{2}$	.70	12, 13, 14, 16, 20, 24, 27	$2\frac{1}{8}$	8.00	4 1-2
$\frac{9}{16}$	.80	12, 14, 27	$2\frac{1}{4}$	9.20	4 1-2
$\frac{5}{8}$	.90	10, 11, 12, 20, 24, 27	$2\frac{3}{8}$	10.50	4 1-2
$\frac{11}{16}$	1.05	10, 11, 12	$2\frac{1}{2}$	11.50	4
$\frac{3}{4}$	1.20	10, 12, 20, 27	$2\frac{5}{8}$	13.00	4
$\frac{7}{8}$	1.40	10, 12	$2\frac{3}{4}$	14.00	4
$\frac{15}{16}$	1.60	9, 10, 12, 27	$2\frac{7}{8}$	15.60	4
1	1.80	9, 12	3	17.00	3 1-2
$1\frac{1}{16}$	2.00	8, 12, 27	$3\frac{1}{8}$	18.75	3 1-2
$1\frac{1}{8}$	2.15	8	$3\frac{1}{4}$	20.50	3 1-2
$1\frac{1}{4}$	2.25	7, 8, 12	$3\frac{3}{8}$	22.00	3 1-4
$1\frac{3}{8}$	2.45	7	$3\frac{1}{2}$	24.00	3 1-4
$1\frac{1}{2}$	2.60	7, 12	$3\frac{5}{8}$	26.00	3 1-4
$1\frac{3}{4}$	2.80	7	$3\frac{3}{4}$	28.50	3
$1\frac{7}{8}$	3.00	6	$3\frac{7}{8}$	30.00	3
$1\frac{9}{8}$	3.25	6	4	32.50	3

The three smallest sizes are furnished with full shanks (size of the top of threads) unless otherwise ordered.

Exact sizes, with threads indicated by the heavy type, V form, will be sent, unless otherwise ordered. United States Standard, Whitworth (English) Standard or V 1-32 oversize supplied at same price if ordered.

WRITE FOR DISCOUNTS.

PIPE TAPS AND REAMERS.



PIPE TAP.

PIPE REAMER.



Size Inches	Price Each	Size Inches	Price Each	Size Inches	Price Each
$\frac{1}{8}$	\$1.12	$\frac{1}{2}$	\$1.87	$1\frac{1}{4}$	\$3.75
$\frac{1}{4}$	1.25	$\frac{3}{4}$	2.50	$1\frac{1}{2}$	4.62
$\frac{3}{8}$	1.50	1	3.12	2	6.25

These Taps are machine relieved. Right Hand Taps furnished unless otherwise specified. Left Hand Taps and Taps with English Threads furnished at same price.

ADJUSTABLE TAP WRENCHES. GREEN RIVER.



No.	Holds Taps Inches	Length Inches	Price Each	No.	Holds Taps Inches	Length Inches	Price Each
1	$\frac{1}{4}$ and smaller	7	\$1.75	4	$\frac{3}{8}$ to 1	21	\$4.00
2	$\frac{3}{16}$ to $\frac{1}{2}$	11	2.35	5	$\frac{7}{8}$ to $1\frac{1}{2}$	34	8.00
3	$\frac{1}{4}$ to $\frac{3}{4}$	16	3.00				

LITTLE GIANT FOR MACHINISTS' TAPS.

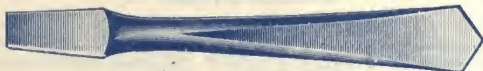


No.	Holds Taps Inches	Length Inches	Price Each
00	$\frac{3}{16}$ and smaller	5	\$1.25
0	$\frac{1}{16}$ to $\frac{1}{4}$	7	1.50
5	$\frac{3}{16}$ to $\frac{1}{2}$	$10\frac{1}{2}$	2.00
6	$\frac{1}{4}$ to $\frac{3}{4}$	15	2.50
7	$\frac{3}{8}$ to 1	20	3.50
$7\frac{1}{2}$	$\frac{3}{8}$ to $1\frac{1}{4}$	30	6.50
8	$\frac{3}{4}$ to $1\frac{1}{2}$	42	8.00

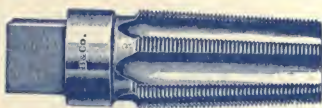
WRITE FOR DISCOUNTS.

STRAIGHT BOILER TAPS.**TAPER BOILER TAPS.**

Diam-eter	Price Each	Threads to Inch	Length Over All	Diam-eter	Price Each	Threads to Inch	Length Over All
$\frac{1}{2}$ in.	\$1.00.	12	$4\frac{5}{8}$ in.	$\frac{3}{4}$ in.	\$2.10	12	$6\frac{3}{4}$ in.
$\frac{3}{8}$ in.	1.00	12	$4\frac{5}{8}$	$\frac{1}{2}$ in.	2.40	12	$6\frac{7}{8}$
$\frac{7}{16}$ in.	1.15	12	5	$\frac{1}{4}$ in.	2.40	12	$6\frac{7}{8}$
$\frac{15}{16}$ in.	1.15	12	5	$\frac{1}{8}$ in.	2.80	12	7
$\frac{1}{8}$ in.	1.30	12	$5\frac{1}{4}$	$\frac{1}{16}$ in.	2.80	12	7
$\frac{3}{16}$ in.	1.30	12	$5\frac{1}{4}$	$\frac{1}{32}$ in.	3.00	12	7
$\frac{1}{4}$ in.	1.45	12	$5\frac{5}{8}$	$\frac{1}{64}$ in.	3.00	12	7
$\frac{5}{16}$ in.	1.45	12	$5\frac{5}{8}$	$\frac{1}{128}$ in.	3.20	12	7
$\frac{3}{8}$ in.	1.60	12	6	$\frac{1}{256}$ in.	3.20	12	7
$\frac{7}{16}$ in.	1.60	12	6	$\frac{1}{512}$ in.	3.40	12	7
$\frac{1}{2}$ in.	1.80	12	$6\frac{3}{8}$	$\frac{1}{1024}$ in.	3.40	12	7
$\frac{5}{8}$ in.	1.80	12	$6\frac{3}{8}$	$\frac{1}{2048}$ in.	3.70	12	7
$\frac{3}{4}$ in.	2.10	12	$6\frac{3}{4}$	$\frac{1}{4096}$ in.	4.20	12	7

FLAT DRILLS.

	Fitting Packer Ratchets									
Size, inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Price, cents.	40	40	40	45	45	45	50	55	60	65

MUD OR WASHOUT TAPS.

Used for tapping washout holes in locomotives.

A set consists of four taps having $1\frac{1}{4}$ inch taper in 12 inches.

Each of these taps is divided into three sections and numbered from 1 to 12, commencing at the small end of the No. 1 tap and finishing at the large end of the No. 4 tap. These divisions correspond with taper plugs having the same numbers as the sections of the taps.

Tap No. 1, illustrated above, is $1\frac{3}{4}$ inches in diameter at small end, and tap No. 4 is three inches in diameter at large end.

The taps are $6\frac{1}{2}$ inches long and all have the same size shank square.

		Price Each.
No. 1.	Diameter at small end $1\frac{3}{4}$ inches.....	\$ 6.00
No. 2.	Diameter at small end $2\frac{1}{8}$ inches.....	7.50
No. 3.	Diameter at small end $2\frac{3}{8}$ inches.....	9.00
No. 4.	Diameter at small end $2\frac{1}{2}$ inches.....	10.00

These taps will be furnished with V form of thread, 12 threads to the inch, unless otherwise specified.

WRITE FOR DISCOUNTS.

CENTER REAMERS.

Accurately made of the best steel and of the most approved form.

Size Shank Inches	Size Cut Inches	Price Each	Price Per Dozen	Size Shank Inches	Size Cut Inches	Price Each	Price Per Dozen
$\frac{1}{8}$	$\frac{1}{4}$	\$0.22	\$2.50	$\frac{1}{2}$	$\frac{3}{4}$	\$0.60	\$7.00
$\frac{3}{8}$	$\frac{3}{8}$	.25	2.90	$\frac{1}{2}$	$\frac{5}{8}$	.50	5.75
$\frac{1}{2}$	$\frac{1}{2}$	.35	3.75				

AIR DRILL REAMERS.

For Boilermakers, Bridge and Ship Builders.



These Reamers are made with five flutes and from the best material. While plainly finished, they are sufficiently accurate for the purpose intended.

We carry these sizes in stock.	Diameter at			List Price Each	No. of Taper Shank	Length Over All	Length of Flute
	A	B	C				
	1-2 in	1-2 in.	1-4 in.	\$2.75	No. 2	9 in.	5 1/2 in.
	9-16	9-16	5-16	2.80	2	9	5 1/4
	5-8	5-8	11-32	2.90	2	10	6 1/4
	11-16	11-16	7-16	3.00	3	11	6 3/4
	3-4	3-4	15-32	3.10	3	12	7
	13-16	13-16	1-2	3.30	3	12	7 1/4
	7-8	7-8	17-32	3.50	3	12	7 1/2
	15-16	15-16	19-32	3.70	3	12	7 3/4
1	1	21-32	3.90	3	12	7 3/8	
1 1/8	1 1/8	23-32	4.10	3	12	7 1/2	
1 1/4	1 1/4	13-16	4.30	3	12	7 1/4	
1 3/8	1 3/8	29-32	4.50	3	12	7 3/8	

LUCKHURST COMBINED REAMER AND COUNTERSINK TOOL.

Patented 1903

A tool for countersinking and reaming a hole in plates without using separate tools for each operation.

Its design is such that the countersink will be concentric with the hole, insuring a more perfect rivet.

It will save about 25% in time and labor.

SIZES CARRIED IN STOCK.

Diameter of Reamer	Length	Shank	Largest Diameter	Angle of Countersink	List Price Each
$\frac{9}{16}$	12 1/2 in.	No. 3 Morse	1 5/16 in.	53°	\$4.60
$\frac{11}{16}$	13 in.	No. 3 Morse	1 3/8 in.	53°	5.00
$\frac{13}{16}$	12 5/8 in.	No. 3 Morse	1 1/2 in.	45°	5.20
$\frac{15}{16}$	12 in.	No. 3 Morse	1 1/4 in.	45°	5.50
1 1/8	11 1/4 in.	No. 3 Morse	1 1/2 in.	37°	6.00
1 3/8	13 1/2 in.	No. 4 Morse	2 in.	37°	6.50

WRITE FOR DISCOUNTS.

FILES. **SCULLY BRAND — GUARANTEED.**



LIST PRICES PER DOZEN.

INCH	HALF ROUND & THREE SQUARE			WARDING			INCH	WOOD FILES			WOOD RASPS						
	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth		Flat	Half Round	Cabinet	Flat	Half Round	Cabinet				
4	\$ 4.80	\$5.60	\$6.10	\$ 4.00	\$4.80	\$5.40	6	\$4.30	\$6.10	\$8.10	\$7.40	\$8.10	\$10.10				
5	5.40	6.10	6.40	4.50	5.30	5.80	7	4.80	7.00	9.30	8.60	9.30	11.70				
6	6.10	6.70	7.10	4.90	5.90	6.40	8	5.30	7.50	10.10	9.40	10.10	12.80				
7	7.00	7.70	8.20	5.90	6.90	7.50	9	6.30	8.50	12.20	11.40	12.20	15.50				
8	7.50	8.30	8.90	6.40	7.50	8.20	10	7.00	9.10	13.70	12.80	13.70	17.50				
9	8.50	9.40	9.90	7.80	9.00	9.90	11	8.60	10.70	16.80	15.50	16.80	20.70				
10	9.10	10.10	10.70	8.70	10.10	11.00	12	9.70	11.80	18.70	17.50	18.70	22.80				
11	10.70	11.80	12.70	10.90	12.70	13.70	13	11.80	14.10	22.40	20.90	22.40	26.80				
12	11.80	13.00	13.90	12.30	14.30	15.40	14	13.30	15.50	24.80	23.20	24.80	29.60				
13	14.10	15.40	16.60	15.20	17.40	18.70	15	16.00	18.50	29.70	27.80	29.70	33.90				
14	15.50	17.00	18.30	17.00	19.40	21.00	16	17.80	20.60	32.90	30.80	32.90	36.90				
15	18.50	20.40	21.70				17	21.50	24.70	38.90	36.20	38.90	42.40				
16	20.60	22.50	24.20	Stave Saw. 8-inch.....\$9.40			18	23.90	27.50	43.60	40.90	43.60	46.90				
17	24.70	27.00	28.90				SHOE RASPS			KNIFE							
18	27.50	29.90	32.00				INCH	Flat	Half Round	Oval	INCH	Bastard	2d Cut	Smooth			
19	32.80	35.70	38.10														
20	36.20	39.40	42.30	Stave Saw Improved 6 inch...\$ 6.40 7 " " " 7.40 8 " " " 8.10 9 " " " 9.70 10 " " " 10.70 12 " " " 15.40			6	\$8.10	\$8.10	\$9.30	4	\$5.40	\$6.10	\$6.40			
Gin Saw, take Bastard Price. Crossing .....adv. 2 in. Tumbler " 2 " Feather Edge (Blunt)..... " 2 " High Back (Blunt)..... " 2 " Half Round (Blunt)..... " 2 "							7	9.30	9.30	10.10	5	6.10	6.70	7.10			
							8	10.10	10.10	12.20	6	6.90	7.50	7.90			
INCH							9	12.20	12.20	13.70	7	7.80	8.50	8.90			
							10	13.70	13.70	16.80	8	8.50	9.10	9.50			
Pit Saw	Cast Saw	Cross Cut	Hook Tooth	Planer Knife	Inserted Tooth or Chisel Tooth	11	16.80	16.80	18.70	9	9.40	10.60	11.30				
Single Cut	Single Cut	Single Cut	Single Cut	Single Cut	Single Cut	12	18.70	18.70	22.40	10	10.10	11.50	12.30				
4	\$ 4.80	\$4.30	\$4.80	.....	.....	13	22.40	22.40	.....	11	12.20	13.70	14.60	
5	5.40	4.70	5.40	\$ 6.70	.....	14	24.80	24.80	.....	12	13.70	15.20	16.10		
6	6.10	5.40	6.10	.....	.....	LAST MAKERS' RASPS			13	16.30	17.90	19.20			
7	7.00	6.10	7.00	7.70	.....	One in. adv. on Cabinet Rasp.			14	18.20	19.90	21.20				
8	7.50	6.40	7.50	8.30	\$6.40	\$8.30	HORSE RASPS			FILE RASPS							
9	8.50	7.80	8.50	9.40	.....	9.40										
10	9.10	8.70	9.10	10.10	8.60	10.10	INCH	Plain	Beveled & Rasp	Tanged	Flat	Half Round					
11	10.70	10.40	10.70	11.80	.....	.....									
12	11.80	11.40	11.80	13.00	12.10	.....	6	.....	.....	.....	\$ 7.40	\$ 8.10	
Climax, adv. 2 in. on Half Round Bastard. Round Gulleting, take Pit Saw price.				PATENT DOUBLE-ENDER WITH HANDLE.			7	.....	.....	.....	8.60	9.30		
							8	.....	.....	.....	9.40	10.10		
The Name							9	.....	.....	.....	11.40	12.20		
							10	\$9.40	\$10.70	\$12.80	12.80	13.70					
Double-Ender	7	8	9	10	Is Our Trade Mark.		11	11.40	12.90	15.20	15.50	16.80					
\$3.50	\$3.90	\$4.40	\$4.90				12	12.80	14.40	16.80	17.50	18.70					
							13	15.20	17.00	19.60	20.90	22.40					
							14	17.80	20.10	23.10	23.20	24.80					
							15	20.90	23.60	27.30	27.80	29.70					
							16	24.40	27.50	32.20	30.80	32.90					
							17	28.90	31.50	.....	36.20	38.90				
							18	32.90	36.20	.....	40.90	43.60				

Blunt Files not specified, advance 1 inch on respective kinds and cuts.
Single or Float Cut not specified on regular shapes, take Double Cut price.
Equalings (Bellied), advance 2 inches on respective kinds and cuts.
Two Round Edges, advance 25 per cent.
Files varying from standard sizes, subject to special prices.

WRITE FOR DISCOUNTS.

FILES.

SCULLY BRAND—GUARANTEED.



LIST PRICES PER DOZEN

INCH	MILL AND ROUND			FLAT			INCH	SQUARE			HAND AND PILLAR		
	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth		Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth
4	\$ 3.00	\$3.50	\$3.90	\$ 3.70	\$4.30	\$4.70	4	\$ 3.80	\$4.60	\$4.90	\$ 3.70	\$4.30	\$4.80
5	3.20	3.80	4.10	3.90	4.60	4.90	5	4.10	4.80	5.30	3.90	4.70	5.30
6	3.50	4.00	4.50	4.30	4.80	5.30	6	4.60	5.10	5.50	4.30	5.10	5.60
7	3.90	4.60	4.90	4.80	5.50	6.10	7	5.10	5.80	6.30	4.90	5.80	6.30
8	4.30	4.90	5.40	5.30	6.10	6.60	8	5.50	6.30	7.00	5.40	6.30	6.70
9	4.90	5.80	6.30	6.30	7.20	7.90	9	6.60	7.70	8.30	6.70	7.80	8.30
10	5.60	6.40	7.00	7.00	8.10	8.70	10	7.40	8.50	9.10	7.50	8.70	9.40
11	6.70	7.80	8.50	8.60	9.80	10.70	11	9.10	10.40	11.30	9.40	10.90	11.80
12	7.50	8.60	9.40	9.70	11.00	12.10	12	10.20	11.50	12.80	10.70	12.30	13.50
13	9.40	10.70	11.70	11.80	13.60	14.70	13	12.50	14.30	15.40	13.30	15.20	16.20
14	10.70	12.20	13.10	13.30	15.30	16.70	14	13.90	16.10	17.50	15.00	17.00	18.20
15	13.10	15.00	16.10	16.00	18.30	20.00	15	16.90	19.20	20.90	17.90	20.60	21.70
16	14.70	16.80	17.90	17.80	20.10	22.30	16	18.70	21.20	23.30	20.10	22.80	24.20
17	18.20	20.20	21.70	21.50	24.20	26.50	17	22.50	25.40	27.50	24.20	27.10	28.60
18	20.20	22.70	24.30	23.90	26.80	29.20	18	25.10	28.20	30.40	26.80	29.90	31.50
19	24.60	27.50	29.40	28.40	31.60	34.60	19	29.70	33.20	35.70	31.90	35.40	37.60
20	27.40	30.70	32.90	31.50	35.30	38.30	20	32.80	36.70	39.30	35.10	39.20	41.60

Mill Blunt, Dbl. Cut, adv. 2 in.

Mill Dbl. Cut, adv. 1 in.

Mill Nar. Pt., adv. 1 in.

Mill Machine, adv. 1 in.

Mill Tri. & Sq., adv. 1 in.

Farmers' Own ad. on Bast. 1 in.

Cant (Blunt), Dbl. Cut, advance 2 in.

Square (Blunt), advance 1 in.

Slotting (Blunt), advance 2 in.

Cotter (Blunt or Taper), advance 2 in.

Reaper, advance 1 in. on 2d Cut.

INCH	MILL One Round Edge			MILL Two Round Edges			INCH	TAPERS		SLIM TAPERS		Band Saw Blt. & Tpr.	
	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth		Single Cut	Double Cut	Single Cut	Double Cut	Regular	Slim
4	\$ 3.40	\$3.90	\$4.40	\$ 3.80	\$4.40	\$4.90	3	\$ 2.10	\$2.50	\$ 2.10	\$2.50	\$2.50	\$2.50
5	3.60	4.30	4.60	4.00	4.80	5.10	3½	2.10	2.50	2.10	2.50	2.50	2.50
6	3.90	4.50	5.10	4.40	5.00	5.60	4	2.20	2.90	2.20	2.60	2.90	2.60
7	4.40	5.20	5.50	4.90	5.80	6.10	4½	2.40	3.10	2.30	3.00	3.10	3.00
8	4.80	5.50	6.10	5.40	6.10	6.80	5	2.60	3.50	2.50	3.20	3.50	3.20
9	5.50	6.50	7.10	6.10	7.30	7.90	5½	3.00	4.00	2.90	3.50	4.00	3.50
10	6.30	7.20	7.90	7.00	8.00	8.80	6	3.40	4.70	3.10	3.90	4.70	3.90
11	7.50	8.80	9.60	8.40	9.80	10.60	7	4.30	5.60	3.80	4.50	5.60	4.50
12	8.40	9.70	10.60	9.40	10.80	11.80	8	5.40	6.70	4.50	5.30	6.70	5.30
13	10.60	12.00	13.20	11.80	13.40	14.60	9	6.60	8.10	5.40	6.30	8.10	6.30
14	12.00	13.70	14.70	13.40	15.30	16.40	10	8.10	9.70	6.40	7.50	9.70	7.50
15	14.70	16.90	18.10	16.40	18.80	20.10	11	10.70	12.10	8.30	9.10	12.10	9.10
16	16.50	18.90	20.10	18.40	21.00	22.40	12	12.50	14.70	9.50	11.00	14.70	11.00
17	20.50	22.70	24.40	22.80	25.30	27.10	13	15.90	17.50	12.10	13.10	17.50	13.10
18	22.70	25.50	27.30	25.30	28.40	30.40	14	18.20	20.60	13.80	15.40	20.60	15.40

Sizes below 4 inches, not extended, take 4-inch price.

Half inches not specified, take next higher full inch price.

Dead smooth, double the price of Bastard Cut.

One Round Edge, advance 12½ per cent.

All lengths above those listed, advance 20 per cent on next lower inch price.

Cuts not specified, made upon regular blanks, advance 1 inch on respective kinds and nearest cut.

WRITE FOR DISCOUNTS.

HACK SAWS.**UNIVERSAL EXTENSION FRAME.****TAKES BLADES 6 TO 12 INCHES.**

We think this the best plan for an extension frame in market. It is light as possible and has the necessary strength; most extension frames are too heavy.



Price, each.....\$1.00 Per dozen\$12.00

UNIVERSAL SOLID FRAME.

The body is made of crucible steel, highly finished. All small parts are case hardened. Handle of rosewood or cocobola. Faces blades in four directions; distance from back of frame to toothed edge of saw, $2\frac{3}{4}$ inches up to 12 inches in length. On this size and also on the extension shown above the distance is $3\frac{1}{8}$ inches.

Length Inches	Price	Length Inches	Price
8	\$0.85	10	\$0.95
9	.90	12	1.00

**HACK SAW BLADES.
IN STOCK.****PRICE LIST.**

Length, in.	Width, in.	Teeth per in.	Gauge	Decimals	Per Gross
8	$\frac{1}{2}$	16	23	.025	\$ 8.00
9	$\frac{1}{2}$	16	23	.025	9.00
10	$\frac{1}{2}$	16	23	.025	10.00
11	$\frac{1}{2}$	16	23	.025	11.00
12	$\frac{9}{16}$	14	23	.025	12.00
12	$\frac{3}{4}$	14	21	.032	15.00
12	$\frac{3}{4}$	10	18	.049	18.00
14	$\frac{3}{4}$	14	21	.032	18.00
14	$\frac{3}{4}$	10	18	.049	21.60
17	1	14	21	.032	27.60
17	$\frac{3}{4}$	10	18	.049	27.60
17	1	10	18	.049	36.00
17	1	8	16	.065	39.00

NOTE:—Our 14 inch Saws are $13\frac{1}{2}$ inches to center of holes.

Our 17 inch Saws are $16\frac{1}{2}$ inches to center of holes.

Please be careful when ordering to specify the saws wanted, giving length, width, teeth per inch, and gauge. When in doubt as to the best saw for your use, write us stating the material and character of your work, and we will send you the saw most fitted to your wants.

WRITE FOR DISCOUNTS.

NORTON GRINDING WHEELS.

PRICE LIST OF NORTON GRINDING WHEELS

Thickness of Wheels in Inches

Diam. in In.	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	4
1	.25	.30	.30	.35	.35	.40	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	1.00
1 1/2	.30	.35	.40	.45	.45	.50	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10
2	.35	.45	.50	.55	.55	.60	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.05	1.10	1.20
2 1/2	.40	.55	.65	.70	.75	.80	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	2.05
3	.50	.65	.80	.90	.95	1.05	1.10	1.25	1.40	1.55	1.70	1.85	2.00	2.15	2.30	2.45	2.60	2.90
3 1/2	.60	.80	.95	1.05	1.15	1.25	1.35	1.55	1.75	1.95	2.15	2.35	2.55	2.75	2.95	3.15	3.35	3.75
4	.75	.95	1.10	1.25	1.35	1.50	1.60	1.85	2.10	2.35	2.60	2.85	3.10	3.35	3.60	3.85	4.10	4.60
4 1/2	.90	1.10	1.25	1.40	1.55	1.70	1.85	2.15	2.45	2.75	3.05	3.35	3.65	3.95	4.25	4.55	4.85	5.45
5	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.60	3.00	3.40	3.80	4.20	4.60	5.00	5.40	5.80	6.20	7.00
6	1.40	1.60	1.75	2.10	2.40	2.75	3.05	3.70	4.35	5.00	5.65	6.30	6.95	7.60	8.25	8.90	9.55	10.85
7	1.85	2.00	2.15	2.60	3.00	3.45	3.85	4.70	5.55	6.40	7.25	8.10	8.95	9.80	10.65	11.50	12.35	14.05
8	2.10	2.35	2.60	3.10	3.60	4.10	4.60	5.60	6.60	7.60	8.60	9.60	10.60	11.60	12.60	13.60	14.60	16.60
9	2.50	2.80	3.10	3.70	4.25	4.85	5.40	6.55	7.70	8.85	10.00	11.15	12.30	13.45	14.60	15.75	16.90	19.20
10	3.00	3.35	3.65	4.35	5.00	5.70	6.35	7.70	9.05	10.40	11.75	13.10	14.45	15.80	17.15	18.50	19.85	22.55
12	3.60	3.80	4.00	5.00	6.00	6.70	7.40	9.00	10.70	12.75	14.00	15.70	17.40	19.00	20.75	22.50	24.25	27.50
14	4.05	5.15	6.25	7.35	8.45	9.55	10.65	12.85	15.05	17.25	19.45	21.65	23.85	26.05	28.25	30.45	32.65	37.05
16	...	...	...	...	10.85	12.30	13.70	16.55	19.40	22.25	25.00	27.95	30.80	33.65	36.50	39.35	42.20	47.90
18	...	...	...	...	13.25	15.15	17.00	20.75	24.50	28.25	32.00	35.75	39.50	43.25	47.00	50.75	54.50	62.00
20	...	...	...	...	...	...	20.25	24.75	29.25	33.75	38.25	42.75	47.25	51.75	56.25	60.75	65.25	74.25
22	...	...	...	...	...	...	25.00	31.00	37.00	43.00	49.00	55.00	61.00	67.00	73.00	79.00	85.00	97.00
24	...	...	...	...	...	...	29.00	36.00	43.00	50.00	57.00	64.00	71.00	78.00	85.00	92.00	99.00	113.00
26	...	...	...	...	...	...	...	43.00	51.00	59.00	67.00	75.00	83.00	91.00	99.00	107.00	115.00	131.00
30	...	...	...	...	...	...	...	...	61.00	72.00	83.00	94.00	105.00	116.00	127.00	138.00	149.00	171.00

WRITE FOR DISCOUNTS.

BOLT CLIPPERS. IN STOCK.

PORTER'S GENUINE "NEW EASY."



ADJUSTED BY SET SCREW.

No special wrench or shims needed.

No. 0.	For $\frac{1}{8}$ in. bolts, weight 3 lbs.....	each	\$3.75
No. 1.	For $\frac{3}{8}$ in. bolts, weight $5\frac{3}{4}$ lbs.....	"	5.00
No. 2.	For $\frac{1}{2}$ in. bolts, weight 8 $\frac{3}{4}$ lbs.....	"	7.00
No. 3.	For $\frac{5}{8}$ in. bolts, weight 12 $\frac{1}{2}$ lbs.....	"	9.00

The Nos. 0 and 1 have open handle grips. The Nos. 2 and 3 have solid grips.

PORTER'S GENUINE "EASY." IN STOCK.

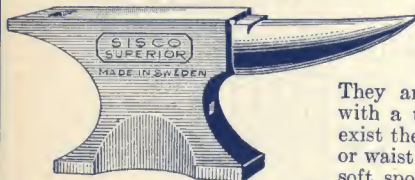


Adjusted by Shims.

Adjusting shims and wrench packed with each clipper.

No. 1.	For $\frac{3}{8}$ in. bolts, weight $4\frac{1}{4}$ pounds.....	each	\$5.00
No. 2.	For $\frac{1}{2}$ in. bolts, weight $7\frac{1}{2}$ pounds.....	"	7.00

SWEDISH SOLID STEEL ANVILS.



These anvils are made in Sweden from the finest steel making ores in the world.

They are made in one solid piece with a tempered face. As no welds exist there is no plate to become loose or waist to break. The face has no soft spots nor do its edges chip off.

We guarantee them equal to the best in the market.

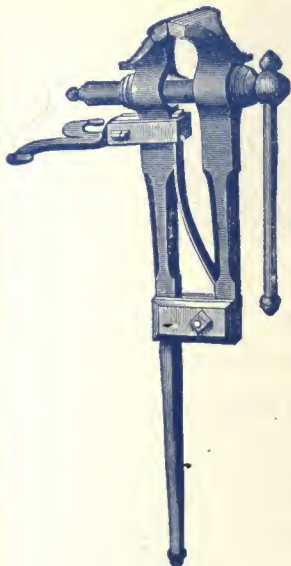
SIZES CARRIED IN STOCK.

Approximate Weight.	Face.	Length over all.	Hardie Hole.	Pritchel Hole.	Height.
100 lbs.	$3\frac{3}{4}$ " x 13"	$21\frac{1}{4}$ "	$\frac{3}{4}$ " sq.	$\frac{1}{2}$ " rd.	$9\frac{1}{2}$ "
125 lbs.	4 " x 14"	23 "	$\frac{7}{8}$ " sq.	$\frac{1}{2}$ " rd.	10"
150 lbs.	$4\frac{1}{2}$ " x $15\frac{1}{2}$ "	$25\frac{1}{2}$ "	1 " sq.	$\frac{5}{8}$ " rd.	$10\frac{1}{2}$ "
175 lbs.	$4\frac{1}{2}$ " x 16"	$26\frac{1}{2}$ "	1 " sq.	$\frac{5}{8}$ " rd.	$11\frac{1}{2}$ "
200 lbs.	5 " x $16\frac{1}{2}$ "	27 "	1 " sq.	$\frac{5}{8}$ " rd.	12"
250 lbs.	5 " x $17\frac{1}{2}$ "	29 "	1 " sq.	$\frac{5}{8}$ " rd.	13"
300 lbs.	$5\frac{1}{2}$ " x 19"	31 "	$1\frac{1}{4}$ " sq.	$\frac{5}{8}$ " rd.	$13\frac{1}{2}$ "
400 lbs.	$5\frac{3}{4}$ " x 21"	$34\frac{3}{4}$ "	$1\frac{1}{4}$ " sq.	$\frac{3}{4}$ " rd.	15"
500 lbs.	$6\frac{1}{2}$ " x 23"	37 "	$1\frac{1}{4}$ " sq.	$\frac{3}{4}$ " rd.	16"

WRITE FOR PRICES.

BLACKSMITH OR SOLID BOX VISES.

IN STOCK.



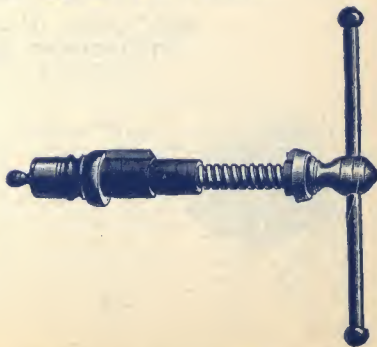
These Vises are sold by number only. The number indicates as nearly as possible the weight of the Vise in pounds.

No.	Width of Jaw	Price Each	No.	Width of Jaw	Price Each
25	3 $\frac{1}{4}$ in.	\$12.00	105	6 in.	\$23.00
30	3 $\frac{1}{2}$ in.	11.00	110	6 in.	24.00
35	3 $\frac{3}{4}$ in.	10.00	115	6 in.	25.00
40	4 in.	10.50	120	6 $\frac{1}{2}$ in.	26.00
45	4 $\frac{1}{4}$ in.	11.00	125	6 $\frac{1}{2}$ in.	27.50
50	4 $\frac{1}{2}$ in.	11.50	130	6 $\frac{1}{2}$ in.	29.00
55	4 $\frac{3}{4}$ in.	12.00	135	6 $\frac{1}{2}$ in.	31.50
60	5 in.	13.00	140	7 in.	33.00
65	5 in.	14.00	145	7 in.	35.00
70	5 $\frac{1}{4}$ in.	15.00	150	7 in.	36.00
75	5 $\frac{1}{4}$ in.	16.00	160	7 $\frac{1}{4}$ in.	41.50
80	5 $\frac{1}{2}$ in.	17.50	170	7 $\frac{1}{4}$ in.	44.50
85	5 $\frac{1}{2}$ in.	18.50	180	7 $\frac{1}{2}$ in.	47.00
90	5 $\frac{3}{4}$ in.	20.00	190	7 $\frac{3}{4}$ in.	53.00
95	5 $\frac{3}{4}$ in.	21.00	200	8 in.	56.00
100	6 in.	22.00			

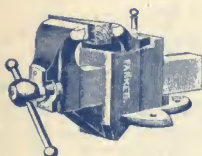
BOXES AND SCREWS.

FOR REPAIRS OF SOLID BOX VISES.

No.	Dia. of Screw	For Vises Nos.	Price Each
1	1 $\frac{1}{8}$	30-45	\$3.50
2	1 $\frac{1}{4}$	50-65	4.00
3	1 $\frac{3}{8}$	70-75	4.50
4	1 $\frac{1}{2}$	80-95	5.50
5	1 $\frac{3}{4}$	100-125	6.50
6	1 $\frac{3}{4}$	130-200	8.00



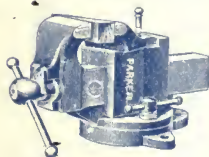
WRITE FOR DISCOUNTS.

PARKER VISES.**PARKER'S PATENT PARALLEL VICTOR.****STATIONARY BOTTOM. SWIVEL JAW.**

Nos.	Jaws Inches	Weight lbs.	Opens Inches	Price Each
340	7½	185	12	\$30.00
370	3¼	25	.....	6.50
371	3⅜	39	.....	7.00
372	4½	57	.....	10.00
373	5	73	.....	14.00
374	5½	98	.....	17.00
375	6¼	150	.....	24.00

SWIVEL BOTTOM. SWIVEL JAW.

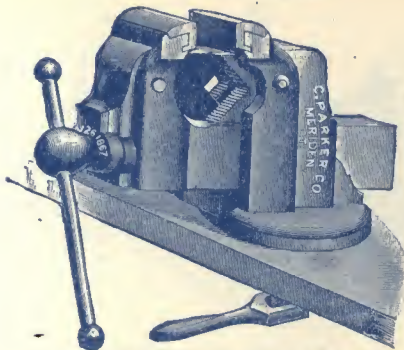
Nos.	Jaws Inches	Weight lbs.	Opens Inches	Price Each
240	7½	200	12	\$35.00
270	3¼	30	.....	7.00
271	3⅜	42	.....	8.50
272	4½	60	.....	12.50
273	5	78	.....	16.00
274	5½	110	.....	19.00
275	6¼	165	.....	27.00

**STATIONARY BOTTOM.**

Nos.	Jaws Inches	Weight lbs.	Opens Inches	Price Each
000x	3¼	28	4¼	\$ 6.25
1x	3¾	46	5½	7.00
2x	4¼	60	6½	9.00
3x	4¾	75	8¼	11.75
4x	5½	113	9½	16.25
5x	6¼	150	10½	24.00
60	8⅞	240	12½	50.00

WRITE FOR DISCOUNTS.

PARKER'S PATENT COMBINATION PIPE. SWIVEL BOTTOM.



PARKER'S IMPROVED.

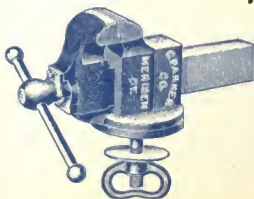
- No. 87 —Round and pipe jaws, weight 42 pounds, jaw $3\frac{5}{8}$ inches, for holding 2 inch pipe and under, each \$16.00
 No. 88 —Round and pipe jaws, weight 59 pounds, jaws $4\frac{1}{8}$ inches, for holding 3 inch pipe and under, each 20.00
 No. 288 $\frac{1}{2}$ —Round and pipe jaws, weight 105 pounds, jaws $4\frac{3}{4}$ inches, for holding 4 inch pipe and under, each 28.00
 No. 289 $\frac{1}{2}$ —Round and pipe jaws, weight 155 pounds, jaws $5\frac{3}{8}$ inches, for holding 6 inch pipe and under, each 35.00

STATIONARY BOTTOM—PARKER'S IMPROVED.

- No. 88 $\frac{1}{2}$ —Round and pipe jaws, weight 94 pounds, jaws $4\frac{3}{4}$ inches, for holding 4 inch pipe and under, each \$28.00
 No. 89 $\frac{1}{2}$ —Round and pipe jaws, weight 150 pounds, jaws $5\frac{3}{8}$ inches, for holding 6 inch pipe and under, each 35.00

PARKER'S VULCAN.

SWIVEL BOTTOM.

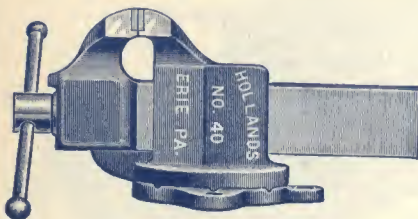


Nos.	Jaws Inches	Weight lbs.	Opens Inches	Price Each
AA	$3\frac{1}{4}$	28	$4\frac{1}{2}$	\$ 7.50
BB	$3\frac{5}{8}$	$32\frac{1}{2}$	5	8.75
CC	$4\frac{1}{8}$	51	$5\frac{1}{2}$	10.50
DD	$4\frac{5}{8}$	69	$6\frac{1}{2}$	12.50
EE	5	79	7	16.00
FF	$5\frac{1}{2}$	115	$8\frac{1}{2}$	22.00
GG	6	162	$9\frac{1}{2}$	30.00

WRITE FOR DISCOUNTS.

HOLLAND'S MACHINISTS' VISES.

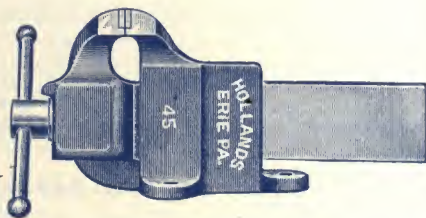
SWIVEL BOTTOM.



No.	Jaws In.	Opens In.	Wt. lbs.	Price Each
8	2	3	8	\$ 4.30
8½	2½	3½	16	5.20
10	3¼	4	30	7.50
20	3½	5	35	8.75
30	4	6	56	11.00
40	4½	7	71	12.50
50	5	8	91	16.00
60	6	9	157	30.00
70	7	11	220	33.00

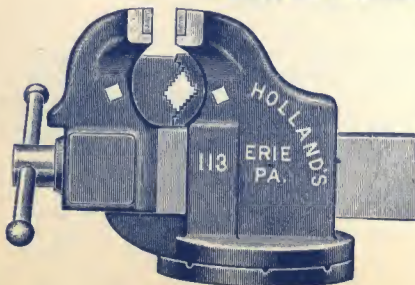
STATIONARY BOTTOM.

No.	Jaws In.	Opens In.	Wt. lbs.	Price Each
3	2	3	6	\$ 3.80
3½	2½	3½	13	4.75
5	3¼	4	24	6.00
15	3½	5	30	7.00
25	4	6	45	9.00
35	4½	7	56	10.00
45	5	8	70	13.00
55	6	9	137	25.00
59	7	11	195	28.50



EXTRA HEAVY COMBINATION PIPE VISE.

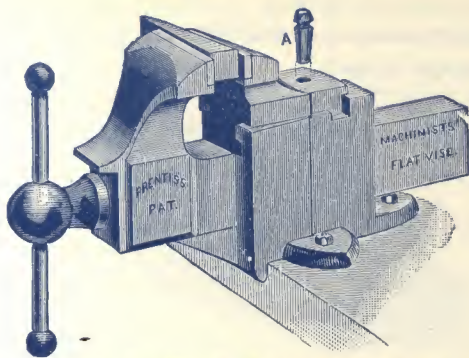
SWIVEL BOTTOM.



No.	Jaws In.	Holds Pipe In.	Wt. lbs.	Price Each
113	4	½ to 2	63	\$16.00
115	4¼	¾ to 3	91	20.00

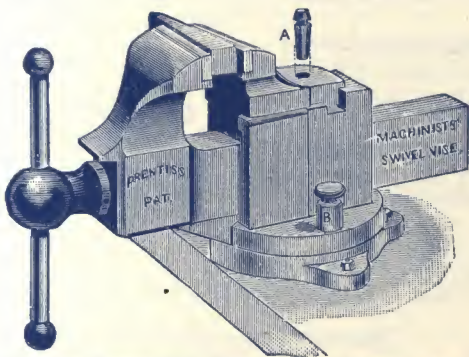
WRITE FOR DISCOUNTS.

PRENTISS VISES. IRON WORKERS'.



STATIONARY BOTTOM, SELF-ADJUSTING JAW.

Nos.	Jaws Inches	Weight lbs.	Opens Inches	Price Each	Nos.	Jaws Inches	Weight lbs.	Opens Inches	Price Each
1	2 $\frac{5}{8}$	13 $\frac{1}{2}$	3 $\frac{1}{2}$	\$ 5.50	4	5 $\frac{1}{4}$	96	8	\$17.00
2	3 $\frac{1}{2}$	28	4 $\frac{3}{4}$	7.00	5	6	146	9	24.00
2 $\frac{1}{2}$	4	41	5 $\frac{1}{4}$	9.00	6	7	184	11	30.00
3	4 $\frac{1}{2}$	54	6	10.50					



SWIVEL BOTTOM, SELF-ADJUSTING JAW.

Nos.	Jaws Inches	Weight lbs.	Opens Inches	Price Each	Nos.	Jaws Inches	Weight lbs.	Opens Inches	Price Each
18	2 $\frac{5}{8}$	17	3 $\frac{1}{2}$	\$ 6.75	21	5 $\frac{1}{4}$	109	8	\$19.00
19	3 $\frac{1}{2}$	32	4 $\frac{3}{4}$	8.50	22	6	168	9	27.00
19 $\frac{1}{2}$	4	46	5 $\frac{1}{4}$	10.50	23	7	207	11	35.00
20	4 $\frac{1}{2}$	65	6	12.50					

WRITE FOR DISCOUNTS.

RAILROAD TRACK TOOLS.**CROW BARS.****WEDGE POINT.****PINCH POINT.**

Weight lbs.	Inches Square	Length	Weight lbs.	Inches Square	Length
4	$\frac{3}{4}$	3 ft.	22	$\frac{13}{8}$	5 ft. 9 in.
6	$\frac{7}{8}$	3½ ft.	24	$1\frac{7}{16}$	5 ft. 9 in.
8	1	3 ft. 10 in.	25	$1\frac{1}{2}$	5 ft. 9 in.
10	1	4 ft.	26	$1\frac{1}{2}$	5 ft. 10 in.
12	$1\frac{1}{8}$	4½ ft.	28	$1\frac{9}{16}$	6 ft.
14	$1\frac{13}{16}$	4 ft. 10 in.	30	$1\frac{5}{8}$	6½ ft.
16	$1\frac{1}{4}$	5 ft.	35	$1\frac{5}{8}$	6 ft. 9 in.
18	$1\frac{1}{4}$	5 ft. 4 in.	40	$1\frac{3}{4}$	6 ft. 10 in.
20	$1\frac{3}{8}$	5 ft. 4 in.			

10 to 40 lbs. per lb., \$0.12

**TAMPING BARS.**

10 to 12 lbs. per lb., \$0.16

CLAW BARS.

28 to 30 lbs., with heel .. per lb. \$0.22

28 to 30 lbs., without heel " .18

**TRACK WRENCHES.**

Price..... per lb., \$0.14

RAIL FORKS.

Price..... per lb., \$0.20

**RAIL TONGS.**

Price..... per lb., \$0.20

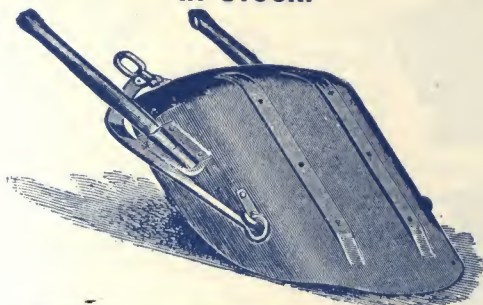
HUNTINGTON TRACK GAUGE.

Weight, dozen, 140 lbs. price per dozen, \$16.00

STANDARD INSULATED TRACK GAUGE.

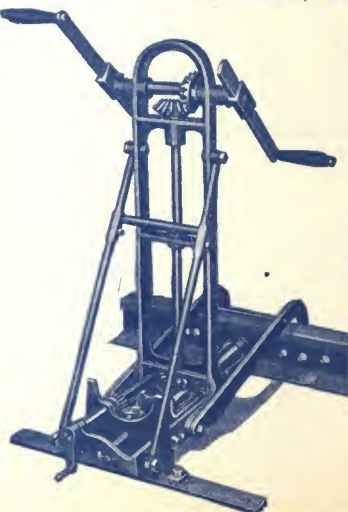
Weight, dozen, 132 lbs. price per dozen, \$16.00

WRITE FOR DISCOUNTS.

LEADER SCRAPERS.**DRAG SCRAPERS, WITH RUNNERS.
IN STOCK.****STEEL, WITHOUT SEAM OR LAP.**

Nos.	Capacity Cubic Feet	Weight lbs.	Price Each
1	7	90	\$7.00
2	5	80	6.40
3	3	70	5.90

Steel hooks, bails and swivels.

**NEW STYLE PAULUS
TRACK DRILL.****VARIABLE FEED.
BALL-BEARING THRUST.**

Latest development in track drills. Has three feed-speeds, dust-proof ball-bearing thrust, small crank for feeding bit to and from work quickly.

Strong and durable, for heavy work.

PRICES.

Equipped for twist bits. . \$20.00

Equipped for Rich bits. . 25.00

Weight, 95 lbs.

WRITE FOR DISCOUNTS.

CONE-BEARING RATCHET SCREW JACKS.

Regular

This Jack will save time enough in a month to pay for itself. It is light, can be handled quickly, works rapidly and is always ready for use. For short, heavy lifting, putting in brasses and general yard work, no railroad can afford to be without them. The special Jack has patent hold-down which positively prevents wheel rising with journal. When not in use, the arm is folded down out of the way.

Special
Patented 1907

	Style	Height In.	Rise In.	Weight Lbs.	Capacity Tons	List Price
W Regular	9¾	4	45	15	\$22.00
W Special	9¾	4	50	15	28.00
Lovejoy Improved	10	4	35	15	22.00

**LOCOMOTIVE JACK SCREWS.
IN STOCK.**

Diam. of Screw, In.	Height of Stand, In.	Height over all, In.	Lifting Ca- pacity, Tons	List Price, Each	Diam. of Screw, In.	Height of Stand, In.	Height over all, In.	Lifting Ca- pacity, Tons	List Price, Each
1½	6	9¼	12	\$3.75	2	8	12	20	\$ 6.00
1½	8	11¼	12	4.25	2	10	14¼	20	6.75
1½	10	13¼	12	4.75	2	12	16	20	7.50
1½	12	15¼	12	5.25	2	14	18	20	8.25
1½	14	17¼	12	6.00	2	16	19¾	20	9.25
1½	16	19¼	12	6.75	2¼	8	12	24	7.50
1¾	6	9½	16	4.50	2¼	10	14	24	8.25
1¾	8	11½	16	5.00	2½	8	12¼	28	8.75
1¾	10	13½	16	5.75	2½	10	14½	28	9.75
1¾	12	15½	16	6.25	2½	12	16	28	10.75
1¾	14	17½	16	6.75	2½	14	18	28	12.00
1¾	16	19½	16	7.50	2½	16	20¼	28	13.25
2	6	10	20	5.25					

Lever will be sent only when ordered, and will be charged extra. Other sizes shipped promptly from factory.

**IMPROVED STONE JACKS.
PRICE LIST.**

Size	Height	Est. Wt.	LIST PRICE
3 ton	3 ft. ½ in.	95 lbs.	\$50.00
4	3 1	100	55.00
5	3 1½	110	62.00
6	3 2	125	70.00
7	3 2½	135	77.50
8	3 3	145	84.50
10	3 3½	160	110.00
12	3 4	170	120.00
15	3 5	185	140.00
18	3 5	275	150.00
20	3 5	300	162.50
25	3 5	350	175.00
30	3 6	400	200.00

Jacks 18 ton and heavier are wood frame.



WRITE FOR DISCOUNTS.

SIMPLEX CAR AND TRACK JACKS. IN STOCK.



No. 1 SIMPLEX TRACK JACK.

Double Acting Trip.

Capacity.....	10 tons
Lift.....	13½ in.
Height.....	24 in.
Weight.....	65 lbs.
Number of Pieces.....	8

List Price, \$18.00

SIMPLEX CAR JACKS.

Malleable standard. steel lever socket, forged rack bar, interchangeable pawls, tool steel pin, brass button indicator.

Lifts or lowers by turning indicator on side.
Operative at any angle.

	No. 15	No. 14	No. 10
Capacity.....	15 tons	15 tons	10 tons
Lift.....	17½ in.	10 in.	12½ in.
Height.....	28 in.	22½ in.	22 in.
Weight.....	86 lbs.	73 lbs.	47 lbs.
Number of Pieces.....	11	11	11
List Price.....	\$35.00	\$40.00	\$25.00



SIMPLEX CAR JACKS—GEARED.

Automatic lowering. Operative at any angle. For loaded cars, locomotives and heavy work of all kinds.

	No. 20 Single Acting.	No. 30 Double Acting.	No. 31 Single Acting.	No. 36 Single Acting.
Capacity	20 tons	30 tons	35 tons	35 tons
Lift.....	16¼ in.	16¼ in.	16¼ in.	26½ in.
Height.....	27 in.	27 in.	27 in.	36 in.
Weight.....	135 lbs.	172 lbs.	175 lbs.	215 lbs.
No. of Pieces.....	20	20	20	20
List Price . . .	\$100.00	\$125.00	\$135.00	\$150.00



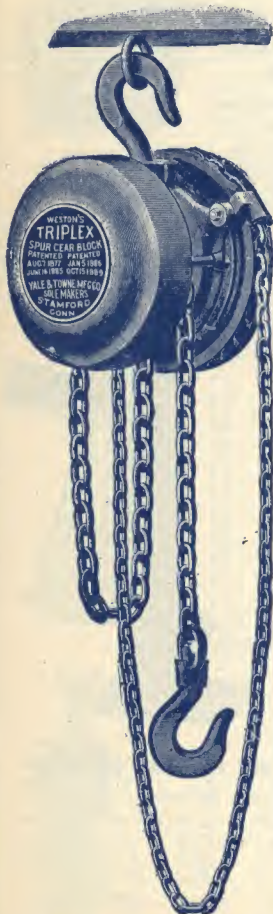
WRITE FOR DISCOUNTS AND SIMPLEX BOOKLET.

YALE & TOWNE

"TRIPLEX" CHAIN BLOCKS.

Spur-Geared.

Highest Efficiency.



These are the only hand hoists that can be said to approach the convenience and efficiency of power equipment, and their low cost recommends them especially for work where the expense of power equipment is prohibitory. They enable one man to swing the heaviest loads with ease and absolute safety. Many large plants have installed "Triplex" blocks as individual hoists to supplement their heavy power cranes.

The high efficiency of the "Triplex" block is due to its independent, self-sustaining mechanism which saves the power other blocks lose.

ALL SIZES IN STOCK.

Capacity in Tons.	Price Complete	Hoist in Feet.	Extra Hoist Price per Foot.	Weight in lbs.
$\frac{1}{2}$	\$ 35.00	8	\$0.90	51
1	45.00	8	.95	89
$1\frac{1}{2}$	60.00	8	1.00	133
2	70.00	9	1.05	203
3	90.00	10	1.50	206
4	110.00	10	1.60	307
5	140.00	12	2.15	397
6	165.00	12	2.15	417
8	200.00	12	2.70	505
10	240.00	12	3.25	622
12	300.00	12	4.30	800
16	360.00	12	5.40	1000
20	425.00	12	6.50	1150

"Triplex" $\frac{1}{2}$ to 2 tons.

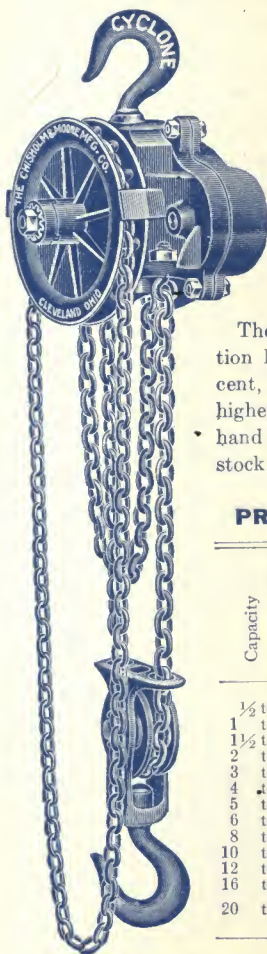
The sizes from 3 to 20 tons have a lower block.

We send Triples Blocks on trial to responsible parties.

Repair Parts carried in our Chicago stock.

WRITE FOR DISCOUNTS.

"CYCLONE" **HIGH SPEED CHAIN HOIST.** **WITH SELF-LUBRICATING BEARINGS.**



ALL GEARS CUT.
 NO OVERHANG-
 ING BEARINGS.
 HIGH
 EFFICIENCY.
 HIGH SPEED.
 GREAT
 DURABILITY



The movement affords the least possible friction loss, the efficiency averaging nearly 80 per cent, therefore the Hoist can be geared to a higher speed than any other with no greater hand wheel pull. Sizes $\frac{1}{2}$ ton to 10 tons in stock.

ALL SIZES IN STOCK.

PRICE LIST OF COMPLETE HOIST.

Capacity	Price Complete	Height of Lift \uparrow	Ex. Chain per foot of Lift	Weight Complete with Chains	Ft. of Chain Handled to Lift Load One Foot	Shortest Dist. Bet'n Hooks
$\frac{1}{2}$ ton	\$ 35.00	8 ft.	\$0.90	62 lbs	19 ft.	15 in.
1 ton	45.00	8 ft.	.95	85 lbs.	29 $\frac{1}{2}$ ft.	18 in.
1 $\frac{1}{2}$ ton	60.00	8 ft.	1.00	107 lbs.	35 ft.	24 in.
2 ton	70.00	9 ft.	1.05	133 lbs.	39 $\frac{1}{2}$ ft.	26 in.
3 ton	90.00	10 ft.	1.50	195 lbs.	69 ft.	31 in.
4 ton	110.00	10 ft.	1.60	250 lbs	91 ft.	36 in.
5 ton	140.00	12 ft.	2.10	386 lbs.	123 ft.	40 in.
6 ton	165.00	12 ft.	2.10	402 lbs.	140 ft.	42 in.
8 ton	200.00	12 ft.	2.70	464 lbs	159 ft.	45 in.
10 ton	240.00	12 ft.	3.25	610 lbs.	191 ft.	48 in.
12 ton	300.00	12 ft.	3.30	647 lbs.	195 ft.	51 in.
16 ton	360.00	12 ft.	3.80	817 lbs.	231 ft.	57 in.
20 ton	425.00	12 ft.	6.50	1216 lbs.	{ 299 ft. 191 ft.	{ 59 in. 59 in.

The Half Ton and One Ton sizes are made with a single load chain. All other sizes made with double load chains as shown above.

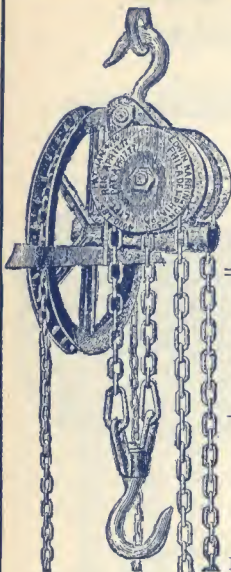
WRITE FOR DISCOUNTS.

GENUINE HARRINGTON SCREW HOISTS.

IN STOCK.

**COMPACT. POWERFUL.
CONVENIENT.**

Worm gear is made of bronze, with square hubs, driven by steel worm. Has double load chain, swiveled hook, new style guard.



LIST PRICES.

Capacity in Pounds.	Regular Lift, in Feet.	Price of Hoist, Regular Lift.	Price of Extra Lift, per Foot.	Minimum Dis- tance between Hooks, in Inches	Weight of Hoist, in Pounds.	Pull on Hand Chain to lift Full Load.	Feet of Chain Handled to lift Load, One Foot.
1,000	8	\$25.00	\$1.20	16	68	49	60.5
2,000	8	30.00	1.50	17	75	71	76.0
3,000	8	40.00	1.75	20	106	99	89.5
4,000	9	50.00	2.00	22	160	129	98.0
6,000	10	75.00	2.20	28	247	163	98.0
8,000	10	95.00	2.40	31	325	190	128.0
10,000	12	140.00	3.00	39	483	293	106.5

DIFFERENTIAL CHAIN BLOCKS.

IN STOCK.

LIST PRICES.

Capacity in Tons.	Price Complete.	Hoist in Feet.	†Extra Hoist Price per Foot.	Net Weight in Pounds.
$\frac{1}{8}$	\$18.00	5	\$2.80	11
$\frac{1}{4}$	18.00	6	2.80	22
$\frac{1}{2}$	21.00	7	2.80	30
1	28.00	8	3.00	51
$1\frac{1}{2}$	36.00	$8\frac{1}{2}$	3.20	81
2	45.00	9	3.40	122
3	60.00	$9\frac{1}{2}$	4.00	180

†Each additional foot of hoist requires four feet of additional chain.



"Differential"

WRITE FOR DISCOUNTS.

YALE & TOWNE "DUPLEX" BLOCKS.



These are the popular type of double chain worm-wheel or screw blocks, designed especially for lightness and compactness in portable use. Their power and speed is excelled by only the "Triplex" block. They lift 25 per cent faster and easier than other screw blocks and cost no more. Their safety device prevents the load chains slipping and insures against accident to operator or work.

Capacity in Tons	Price Complete	Hoist in Feet	Extra Hoist Price Per Foot	Net Weight in pounds
$\frac{1}{2}$	\$ 25.00	8	\$1.20	43
1	30.00	8	1.50	57
$1\frac{1}{2}$	40.00	8	1.75	76
2	50.00	9	2.00	104
3	75.00	10	2.20	200
4	95.00	10	2.40	225
5	140.00	12	3.00	340
6	180.00	12	3.75	360
8	210.00	12	4.00	390
10	275.00	12	4.25	570

"Duplex"

SCULLY WROUGHT STEEL TROLLEYS.

To run on lower flange of I-Beams.

Made with steel bushings, roller bearings and steel side plates.

IN STOCK.



Capacity in pounds	Standard Size of I-Beam, in.	Smallest I-Beam Traveler will fit	List Price of Traveler, Plain	Height of Beam from Floor for Regular Hand Chain*	Extra Hand Chain per foot height
1,000	5	5	\$14.00	9' 4"	\$0.50
2,000	6	6	16.00	9' 6"	.50
3,000	7	7	19.00	9' 9"	.50
4,000	8	8	22.00	11' 0"	.50
6,000	9	9	27.00	12' 3"	.50
8,000	10	9	33.00	12' 8"	.50
10,000	12	10	43.00	15' 0"	.50

*Height to bottom of beam.

WRITE FOR DISCOUNTS.

ROYAL STEEL BLACKSMITH FORGES.



No. 15.

Combining Royal Blower, turning forward or backward, with steel hearth having solid fire-pot with Tuyere ball. Capacity to heat four-inch iron.

No.	Fan	Hearth	Height	Length	Wt. with Tank	Without Tank	With Tank
10	12 in.	30 x 40	50 in.	48 in.	255 lbs.	\$70.00	\$75.00
15 with hood	12 in.	30 x 40	30 in.	48 in.	245 lbs.	65.00	70.00
20 with shield	12 in.	30 x 36	30 in.	44 in.	220 lbs.	58.00	63.00
30	12 in.	30 x 36	30 in.	44 in.	230 lbs.	65.00	70.00
35 with hood	12 in.	30 x 36	30 in.	44 in.	225 lbs.	60.00	65.00
36 with shield	10 in.	24 x 24	30 in.	.....	135 lbs.	40.00	.....
37 with hood	10 in.	24 x 24	30 in.	.....	140 lbs.	44.00	.....

Forges are always shipped without tank unless so ordered.

ROYAL BLOWER.

"The Successful Blower."

Crank turns forward or backward.
Noiseless and easy to operate.
Gear case is oil-tight and dust-proof.
Gears run in a continuous bath of oil.

Gears are steel, flat and straight cut.
No spiral or worm gears.

A powerful blast; lasting after blast.

Fire-pot is 8x9½x4 inches inside.

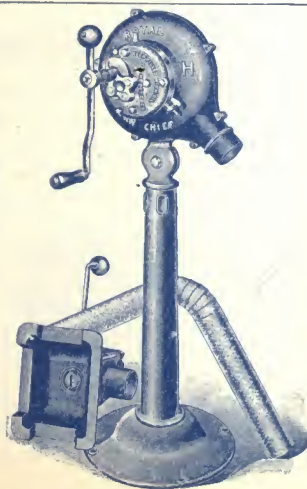
Fan, 12 inches.

Height, 47 inches.

Weight, 135 pounds.

Can be furnished to operate with the right arm, for left-handed smiths, when desired.

Price, complete as shown, \$28.00.



WRITE FOR DISCOUNTS.

PORTABLE RIVET FORGES.**CUMMING PATTERN.**

Light, strong, portable, strong blast.
Largest piece, 18 in. diameter, bronze
gears.

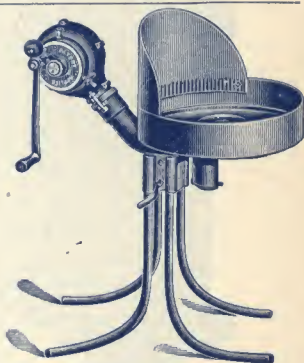
Hearth..... 18 in. dia.
Fan..... 10 in. dia.
Height..... 30 in.
Weight..... 90 lbs.
List Price..... \$35.00

**C-O. PORTABLE RIVET FORGES.**

No. 60.

These forges have cut gears and
oil-tight case, and blower can be re-
volved to make left-hand forge; blast
is sufficient to make welding heat on
3¼-in. iron.

Hearth..... 18 in. dia.
Fan..... 10 in. dia.
Height..... 30 in.
Weight..... 70 lbs.
List Price..... \$35.00

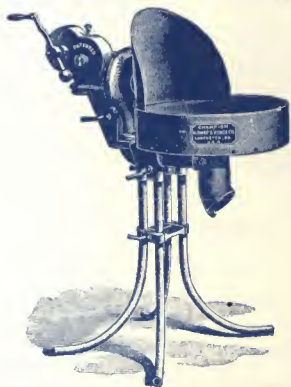
**CHAMPION BALL-BEARING STEEL FORGES.**

Regular and continuous positive
blast.

For Government use, elevated
and steam railroads, bridge and
tank builders, miners, etc.

Height, 30 inches.

Cut shows No. 401, with shield.



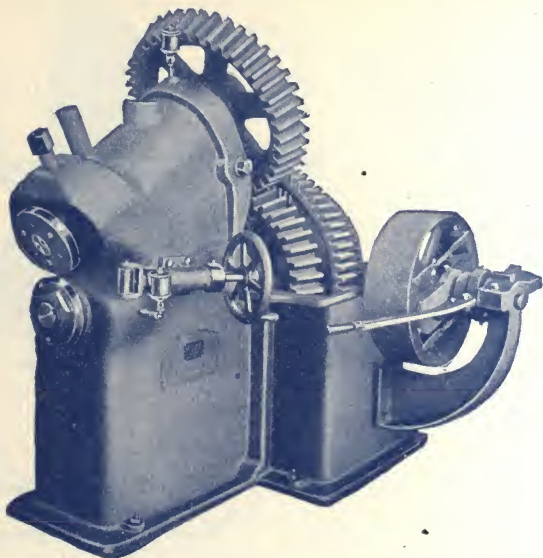
IN STOCK.

No.	Style Forge	Hearth, Inches	Diam. Fan, Inches	Weight, Lbs.	Price Each
401	Rivet, with shield.....	18	9	90	\$35.00
402	Toolmakers', with half hood..	18	9	90	38.00
403	Toolmakers', closed hood.....	18	9	100	40.00

WRITE FOR DISCOUNTS.

WANGLER ROTARY BEVEL SHEARS.

PATENTED



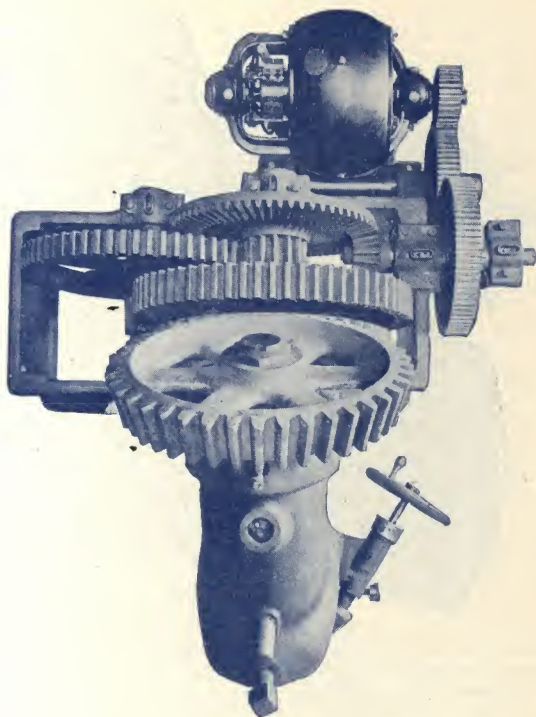
Built in two sizes for the beveling of plates or angles, either straight or irregular.

Size No.	Capacity, inch	Diameter Cutters, inches	Weight	H. P. Required
34	$\frac{3}{4}$	$9\frac{1}{4}$	5,300	10
40	1	12	9,500	15

POINTS OF MERIT.

- (1) Arrangement of cutter shafts, throwing cutting strains nearly at right angles to bearings.
- (2) Flush fastening for top cutter, allowing the beveling of equal leg angles of any size.
- (3) Both cutters are reversible and have two cutting edges.
- (4) Eccentric bolt adjustment for top cutter shaft allows for taking up wear and regrinding cutters.
- (5) The main drive gears on the cutter shafts are of large diameter, reducing the tooth pressure. It is not necessary to have these gears shrouded, and either one can be removed without disturbing other gears.

Will bevel straight or irregular plates as fast as can be handled to the machine. Can be arranged for direct motor drive. Belt driven machines carried in Chicago stock.

WANGLER ROTARY BEVEL SHEARS.

Plan view of motor driven shears, showing gearing.

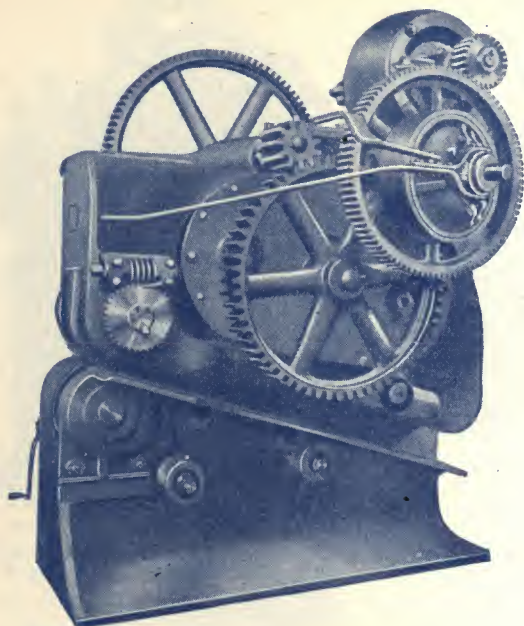
Large nut on rear end of top cutter shaft allows the taking up of end wear. Similar nut is provided on lower cutter shaft.

Both the belted and motor driven shears are provided with friction clutch so that the cut may be started or stopped instantly.

SEND FOR CATALOG.

THE SCULLY PATENTED ROTARY SPLITTING SHEARS.

Patented December 15th, 1903.



Built in two sizes for the cutting of plates of *any length or width.*

Size No.	Capacity Plate	Diameter of Cutters	Thickness of Cutters	Weight	Floor Space	Power Required
1	$\frac{1}{2}$ inch	12 inches	$1\frac{1}{4}$ inches	6500	44 x 60 in.	10 H. P.
2	$\frac{3}{4}$ inch	15 inches	$1\frac{3}{8}$ inches	12300	54 $\frac{1}{2}$ x 73 in.	15 H. P.

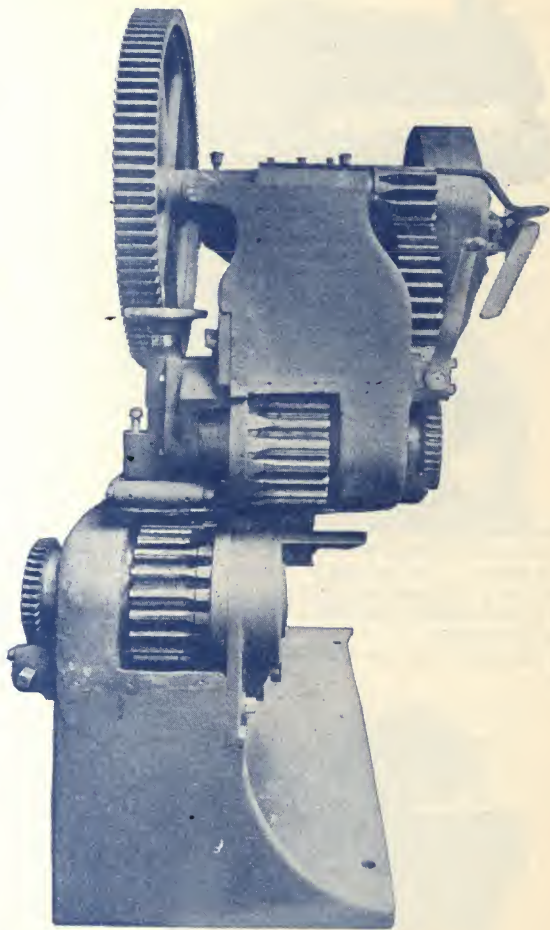
The cutting on these shears is done by means of two hardened tool steel cutting disks, having the edges milled to make self feeding. Both cutters are reversible. *All the gears are spur gears, having the teeth cut from solid metal.* Both cutters are adjustable vertically to allow for the cutting of different thicknesses of plate.

The belt driven shears are carried in Chicago stock.

Both belt and motor driven machines have friction clutch so that cut may be started or stopped instantly.

Write for booklet giving details.

THE SCULLY PATENTED ROTARY SPLITTING SHEARS.



Front view of belt driven shears with cover plates removed, showing the steel cutter driving gears. These are cast steel gears with teeth cut from solid metal.

SCULLY ROTARY THROAT SHEARS.



These shears are limited as to the width of the plate they will cut. They work on the same principle as our bevel shears and spur geared splitting shears. The cutting is done by means of two hardened tool steel cutters. The machine is self-feeding and will cut sheets and plates as fast as the operator can handle them. The usual speed is from 10 to 12 feet per minute.

The following sizes are standard. Can quote on other sizes upon request.

Capacity	Throat	Weight	Horse Power
No. 12	12 in.	1000	
$\frac{1}{8}$ in.	20 in.	3100	2
$\frac{1}{8}$ in.	30 in.	3400	2
$\frac{1}{8}$ in.	36 in.	3700	2
$\frac{3}{16}$ in.	31 in.	2500	$2\frac{1}{2}$
$\frac{1}{4}$ in.	24 in.	3800	3
$\frac{1}{4}$ in.	30 in.	4800	3
$\frac{1}{4}$ in.	42 in.	6200	3
$\frac{1}{2}$ in.	24 in.	4700	5
$\frac{1}{2}$ in.	30 in.	5700	5
$\frac{1}{2}$ in.	42 in.	8000	5

ALLIGATOR SHEARS.

These machines are very valuable for shearing scrap and bars. Made in 25 sizes, having a range of capacities from 1 inch square to 6 inch square bars.

Machines can be furnished belt, engine or motor driven.

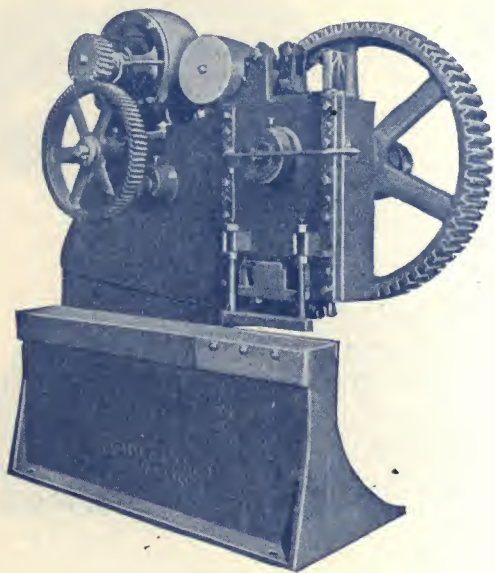


No. 40. High Speed. Knives 12 in. long. Capacity, $1\frac{1}{4}$ in. round.



No. 1. Knives 30 in. long. Capacity, 6x6 in. Cold

SCULLY PLATE SHEARS



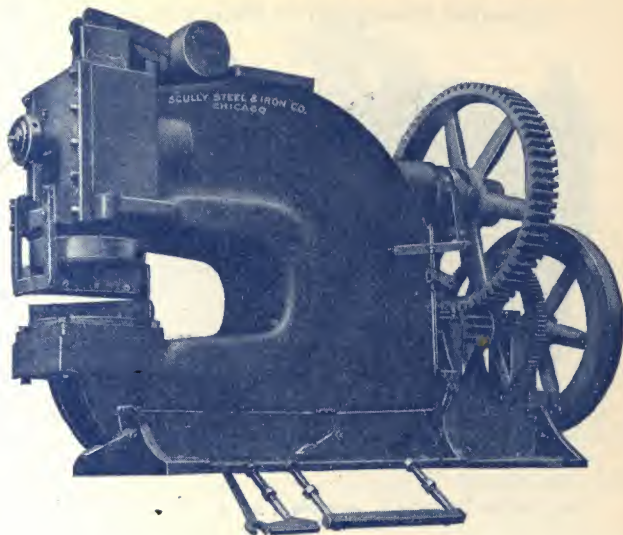
MOTOR DRIVE STROKE SHEARS

Built in a number of standard sizes up to 1-in. plate.

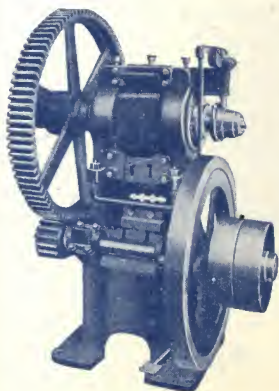
Cut shows machine for the shearing of 1-in. plate and lighter, arranged for motor drive.

Any of these shears can be fitted with bar or angle shearing attachments.

All machines, either belt or motor drive, are fitted with jaw clutch having jaws faced with renewable tool steel blocks.

37-INCH THROAT TURRET SHEARS.

The shear attachment is swiveled, so that it can be set at any angle. Blades are 22" long, capacity to cut 12" of $\frac{3}{4}$ " plate at each stroke. Write for further information.

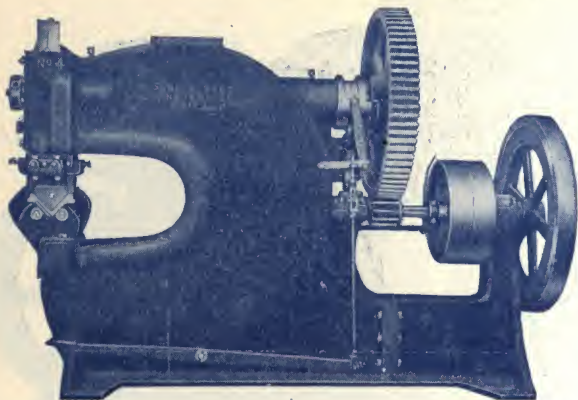
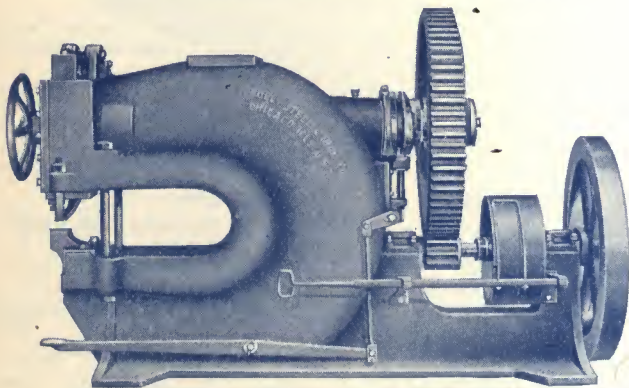
**BAR SHEARS.
GUILLOTINE TYPE.**

Size No.	Capacity			Blades Length	Weight
	Angles	R'nd Bars	Flat Bars		
1	4x4x $\frac{3}{8}$	1 $\frac{1}{2}$	4x $\frac{7}{8}$	9	5000
3	6x6x $\frac{1}{2}$	2 $\frac{1}{4}$	8x1 $\frac{1}{4}$	15	11000
4	6x6x $\frac{3}{4}$	3	10x1 $\frac{1}{4}$	20	17000

Special sizes made to order.

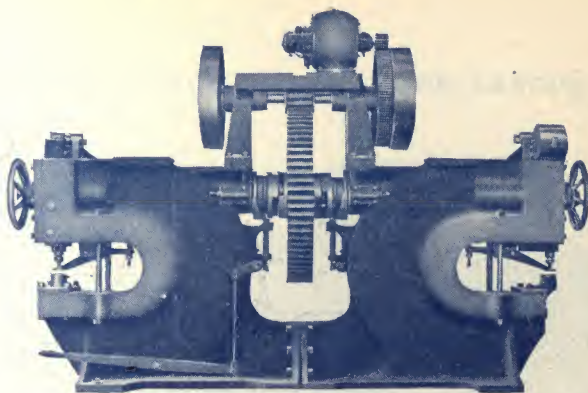
The shear blades are fastened to removable holders, so that several shearing attachments can be furnished with the same machine. Clutches are provided with automatic stop.

SEND FOR CATALOG.

GEARED PUNCHES.**25-INCH PUNCH WITH ANGLE SHEAR.****36-INCH THROAT ARCHITECTURAL PUNCH.**

These geared punches can be furnished in any depth of throat and any capacity. Either plain or architectural jaw can be furnished, and any type of attachments such as plate, angle and bar shears.

DOUBLE PUNCHES.



Double punch, 24-inch throats, capacity $1\frac{1}{4}$ -inch hole in 1-inch plate, with plain and architectural jaws.

Any of our punches can be furnished double end, and shearing attachments furnished.

THROAT PUNCHES.

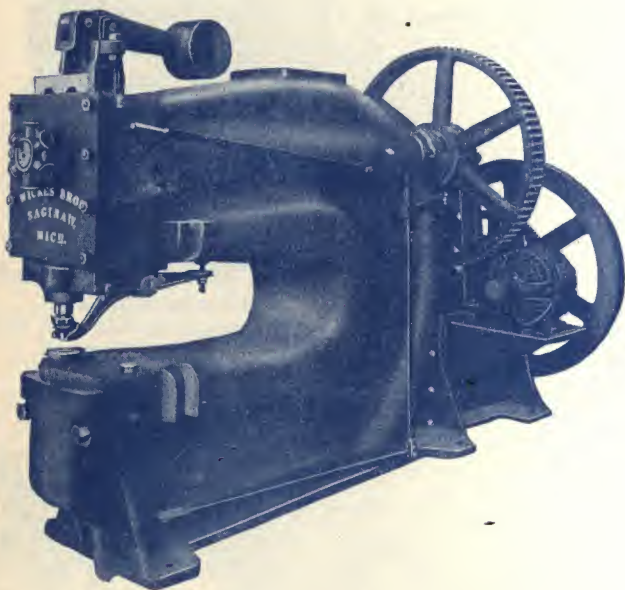
Fly-Wheel Type of Light Punch.



These punches are made in capacities up to $\frac{3}{4}$ -inch hole in $\frac{1}{2}$ -inch plate, and of any depth of throat. Their chief advantage is in quickness of operation, the speed being from 75 to 90 strokes per minute.

All punches are provided with automatic clutch and with automatic brake.

WRITE FOR CATALOG.

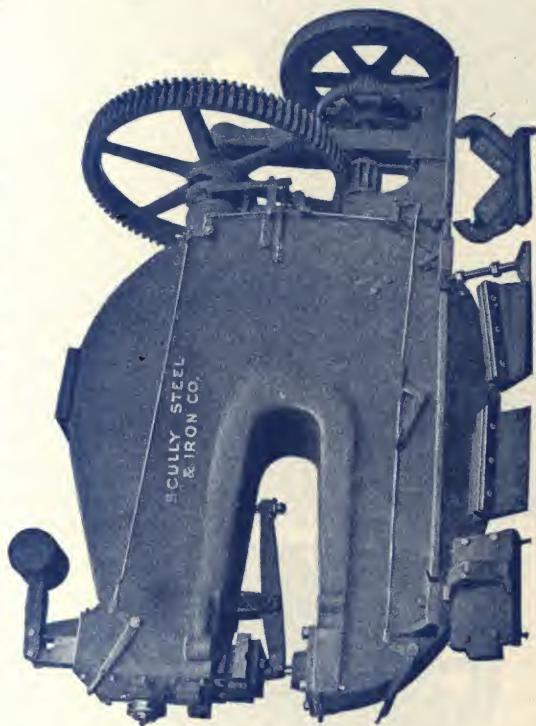
WICKES BROS. HEAVY DUTY PUNCH.

Heavy capacity machines a specialty.

Note the solid frame, and the outboard bearing for main shaft.

Made in any throat and capacity up to 74" for punching 2" hole in 1½" plate.

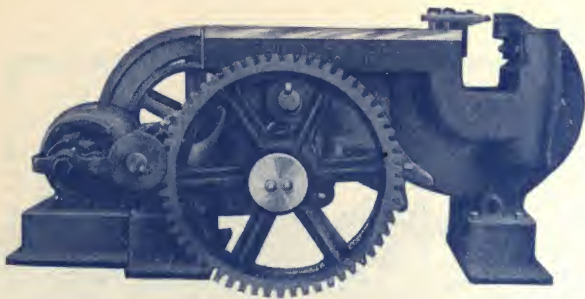
WRITE FOR CATALOG.

60-INCH THROAT PUNCH.

Capacity $2\frac{1}{4}$ inch hole in $1\frac{1}{2}$ inch plate; Shearing $1\frac{1}{4}$ inch plate; 8 inch x 8 inch x $\frac{3}{4}$ inch Angles.
Machine arranged for motor drive.

HORIZONTAL PUNCH.

Two standard sizes.

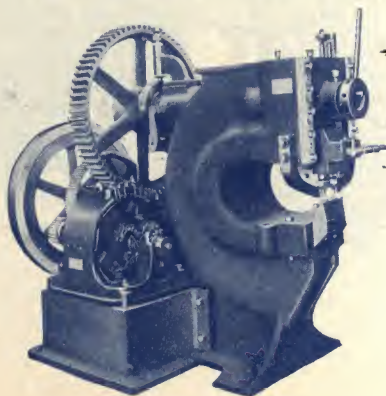


No.	Throat	Capacity	Weight
1	7 in.	$\frac{3}{4} \times \frac{3}{4}$ in.	5800
2	12 in.	$1\frac{1}{4} \times 1$ in.	9500

These machines can be furnished with either forged stake or steel architectural jaw.

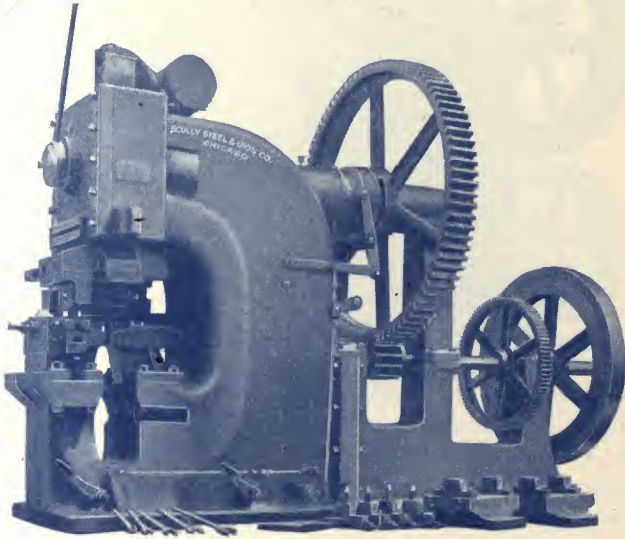
SPECIAL PUNCHES.

Designed and built for special work.



Fifteen-inch throat, architectural jaw, motor driven punch. Capacity 1-inch hole in 1-inch plate. Machine fitted with two different sizes of punch and die, and each punch controlled by a gag.

COPING AND NOTCHING MACHINE.

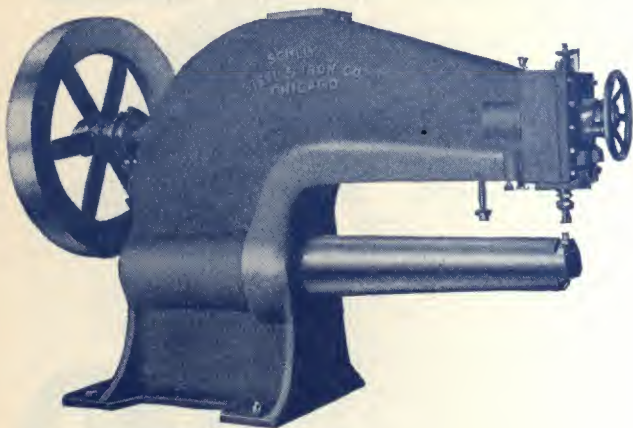


Has 18 in. throat, weight 29,700 pounds. Capacity to cope or notch from 6 in. to 24 in. I Beams inclusive, without changing attachments. Punching capacity two $1\frac{1}{8}$ inch holes through 1 inch material.

The coping and notching attachment is so made that beams or channels can be coped on either end without turning end for end, or can be notched on either flange anywhere along their length.

Can be fitted with various shearing attachments, and multiple punching attachments.

BELT DRIVEN STAKE RIVETERS.



For driving rivets for stack, light pipe work, etc. •

Has forged stake, the gap is greater than in other makes, and is provided with spring holdup so that rivets can be placed in position from outside.

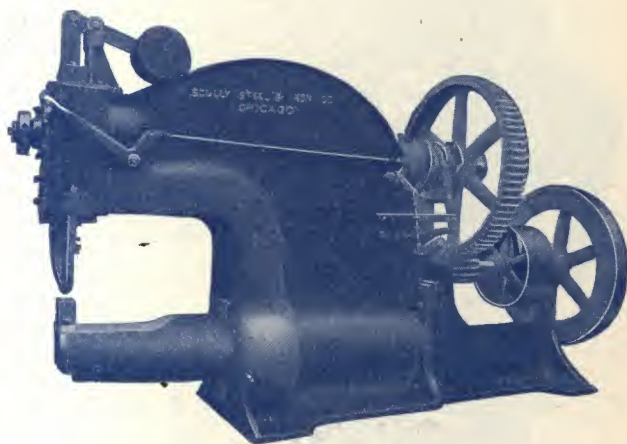
Various attachments may be furnished for these riveters, the punching attachment being the most useful, and is included in the regular equipment.

The speed of these machines should be about 75 R. P. M., an automatic brake being provided to bring the machine to a stop after each stroke.

STANDARD SIZES.

Throat	Cold Rivets	Hot Rivets	Punching	Weight
18 in.	$\frac{1}{4}$ in.	$\frac{3}{8}$ in.	$\frac{3}{8} \times \frac{1}{4}$ in.	4000
30 in.	$\frac{1}{4}$ in.	$\frac{3}{8}$ in.	$\frac{3}{8} \times \frac{1}{4}$ in.	6000
30 in.	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2} \times \frac{3}{8}$ in.	7500
50 in.	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2} \times \frac{3}{8}$ in.	12000
62 in.	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2} \times \frac{3}{8}$ in.	16000
74 in.	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{1}{2} \times \frac{3}{8}$ in.	19000
62 in.	$\frac{1}{2}$ in.	$\frac{5}{8}$ in.	$\frac{5}{8} \times \frac{1}{2}$ in.	22000

GEARED STAKE RIVETERS.



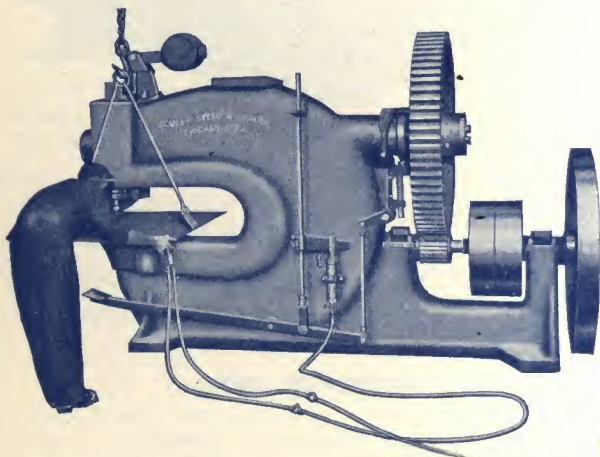
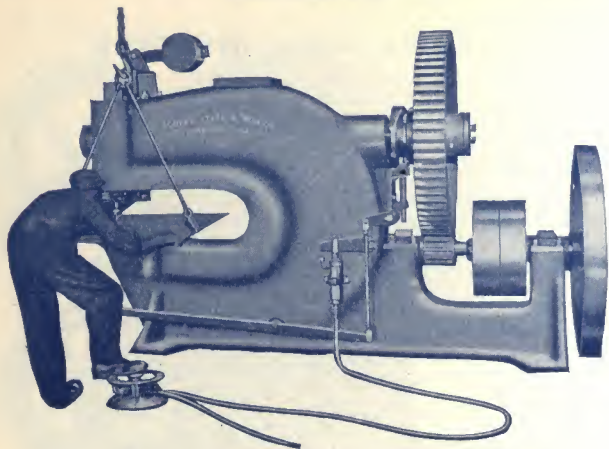
These machines have the same specifications as our standard punches, except that the gears have teeth cut from the solid metal, and are designed to run at 40 strokes per minute. The stake is an open hearth steel forging, pressed in the frame. Machine is as valuable for punching as for driving rivets.

STANDARD SIZES.

Throat	Cold Rivets	Hot Rivets	Punching	Est. Wt.
31 in.	....	1 in.	1 $\frac{1}{16}$ x 1 in.	19000
36 in.	....	$\frac{7}{8}$ in.	$\frac{3}{4}$ x $\frac{3}{4}$ in.	16000
50 in.	$\frac{1}{2}$ in.	$\frac{5}{8}$ in.	2 x $\frac{3}{8}$ in.	17000

CAHALL PORTABLE PNEUMATIC TRIP.

Patent Applied For.



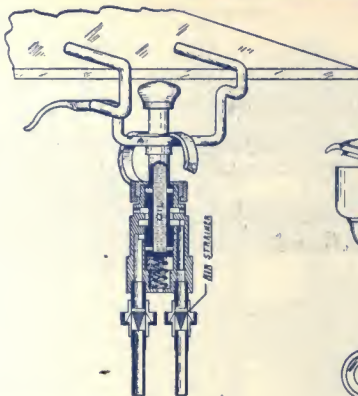
This device consists of a pneumatically actuated motor cylinder arranged to move the clutch lever mechanism of punching, shearing and forging machinery. The motor cylinder is controlled by a portable hand or foot valve flexibly connected thereto by armored hose of small diameter.

The cut above shows one of these devices connected to one of our standard punches. A saving of from \$400 to \$700 annually on each tool can be made by using this device on your punches and shears.

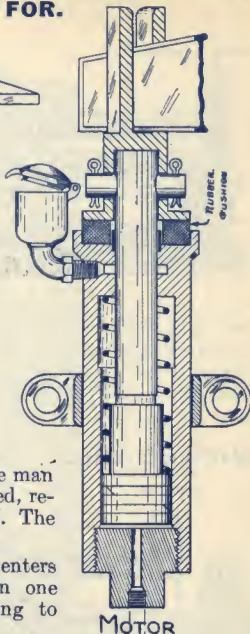
Can be attached to any make of clutch operated machinery.

SEND FOR CATALOG.

CAHALL PORTABLE PNEUMATIC TRIP. PATENT APPLIED FOR.



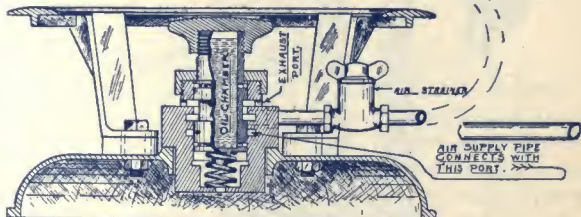
HAND VALVE



Saving. It saves the labor of one man to each machine to which it is attached, reducing cost of labor from 25% to 45%. The valve piston travel is only $\frac{1}{2}$ inch.

Centers Responsibility. It centers the responsibility for good work upon one man, and saves the time lost in signaling to a helper, under the old method.

Convenience and Utility. Aside from its saving, the convenience and utility are of sufficient importance to justify its use, especially in punching holes in the center of wide plates, or in shearing same.



FOOT VALVE

Sectional view of foot valve, hand valve and motor cylinder.

Hand valve may be hung from edge of plate, so that it is not necessary to drop valve on the floor.

Note simple construction throughout. All parts are automatically lubricated.

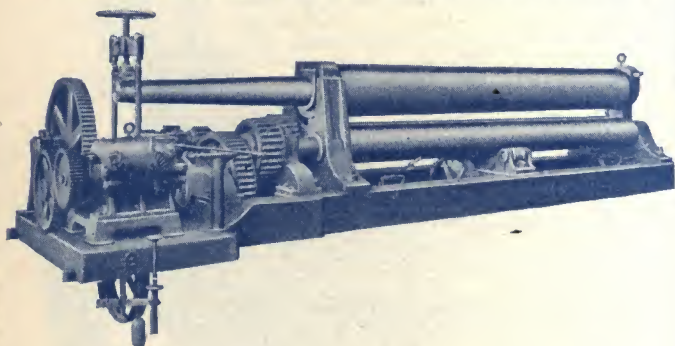
WRITE FOR COMPLETE DESCRIPTIVE CIRCULAR.

PLATE BENDING ROLLS.



This type of Roll is made belt or motor driven, in capacities up to 8 feet 2 inches between housings, for bending $\frac{1}{2}$ -inch plate. Rolls are hammered iron. Top roll has balance bar and drop housing; gears and pinions are cast steel.

WICKES BROS. PLATE BENDING ROLLS.



Wickes Bros. Plate Bending Rolls can be furnished in either the horizontal or vertical type, and of any capacity.

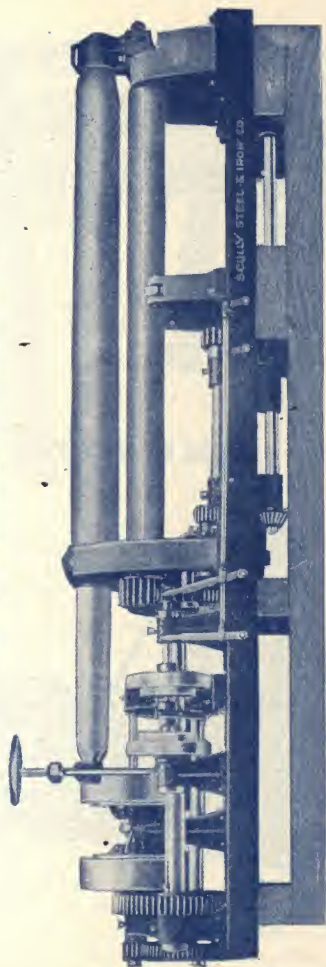
Above cut shows heavy duty rolls, motor driven, and having top roll raised and lowered by power. This power attachment is operated by means of a patented friction, so that only one motor is required.

Note the heavy gearing; also that each of the bottom rolls have independent pinion drive.

These rolls can be furnished either *Engine, Motor* or *Belt* driven, and having either hand or power raising attachment for the top roll.

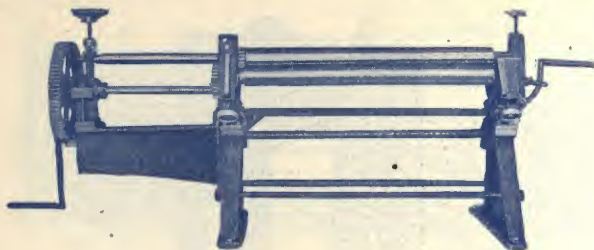
Give us your requirements, so that we may submit detailed specifications and prices.

PLATE BENDING ROLLS.



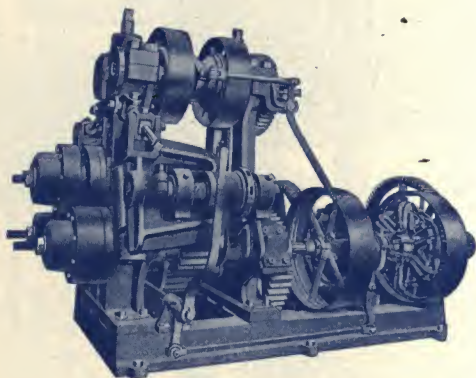
Belt driven rolls can be furnished with top roll raised and lowered by power. Two sets of friction pulleys are provided, the driving mechanism and power raising and lowering mechanism being separate.

HAND POWER SHEET IRON ROLLS.



The above hand rolls have the top roll directly over one bottom roll, and the side roll is adjustable. Machines are provided with balance bar and drop housing. Made in a number of sizes.

SCULLY ANGLE BENDER.

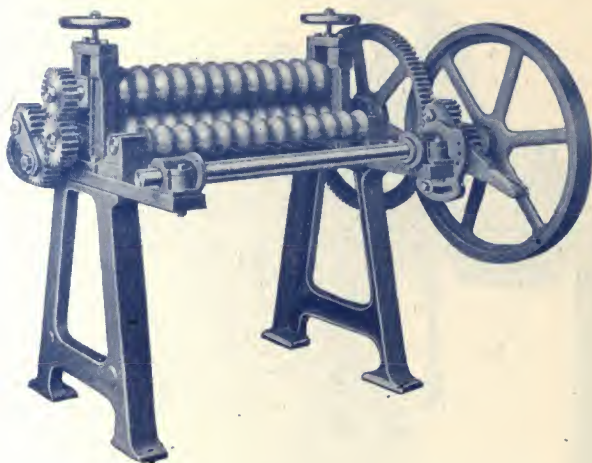


Built in two sizes.

No.	Capacity	Weight	Horse Power
1	4x4x $\frac{1}{2}$	12,000	15
2	6x6x $\frac{1}{2}$	22,000	20

WRITE FOR DETAILS.

ROLLS FOR CORRUGATED IRON.



These Curving Rolls are made for any pitch corrugation. Rolls are 32 inches long and 6 inches in diameter. The machine has four rolls. The roll shown in front of illustration is only a guide to enter the sheet into the pressure rolls; this roll can be lifted out of the boxes and the machine can be used to corrugate Ridge Roll.

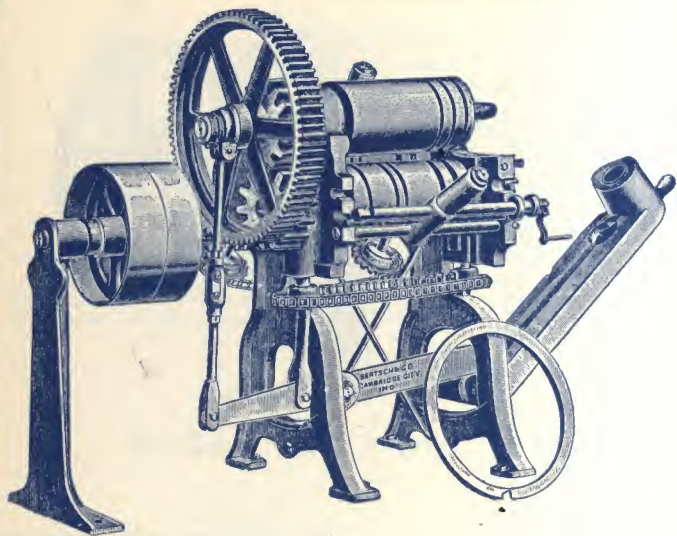
The machine is fitted with 30-inch band wheel, 3-inch face for $2\frac{1}{2}$ -inch belt. For hand power a crank handle is provided, fitted in band wheel. The two pressure rolls and gauge roll are geared together and very heavy work can be curved. The machine has tumbler plate reverse motion and the corrugated sheets do not have to be removed from the machine until finished.

Capacity No. 12 gauge and lighter.

PRICE LIST.

32-inch Slip Roll, weight 3,000 lbs.....	Price, \$350.00
32 " Rolls, " 2,000 "	" 250.00

LIGHT ANGLE BENDERS.

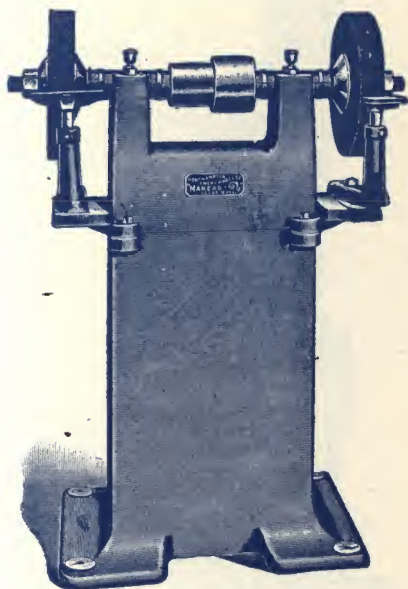


The above cut shows Patented Angle Iron Bending Roll which is made in different sizes, the largest being for 3 inch angles. It will bend either one or two angles at a time, with the flange either in or out. The rolls are 15 inches to 20 inches long, and 5 to 10 inches in diameter, according to size angle to bend. By using the front and rear guide rolls the angles can be bent accurate enough for all practical purposes without counter-bending or hammering. When bending two angles at a time, they are bent back to back (in which case the guides are not used), thus each serves as a guide or support to the other. To bend 2 inch or larger angles, machine is double back geared.

The rear guide roll conforms automatically to the desired curvature while the back roll is being adjusted, as it is carried by the back roll, both being pivoted at the same axis.

The rolls, shafts and pins are made of steel. The gears are extra heavy. The machine is built for either hand or belt power, or both combined. It has Patented Automatic Opening and Closing Device.

GRINDERS.

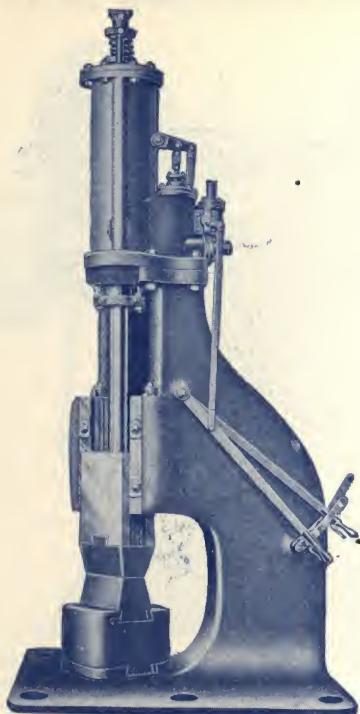


All of these grinders are fitted with crucible machinery steel arbors. Boxes are all dust proof and self-oiling.

Machines can be furnished for either one or two wheels; either for bench, fitted with legs or cabinet base. Built in a number of sizes, for carrying a single 12-inch diameter wheel 1 inch thick, up to larger sizes, carrying two 36-inch wheels 4 inches thick. Can be furnished with or without countershaft. The larger sizes are fitted with two or three step cone pulley, to allow the running of wheels at proper speed as they become worn.

SEND FOR CATALOG.

SINGLE FRAME STEAM HAMMERS.



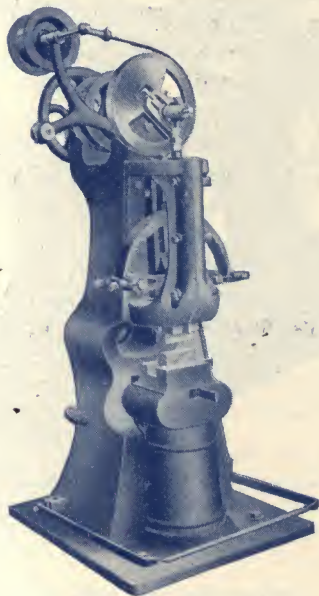
We furnish these in the following sizes:

Size, lbs.	Diam. Cyl'r Inches	Strike Inches	Usual Die Face Inches	Center Die to Frame Inches	Floor Space Inches	Height Floor to Top of Hammer Inches	Total Weight lbs.
250	5	16	4½ x 7	12½	36 x 47	99½	5700
400	6	19	5 x 8½	15	38 x 57	114	8200
600	7	22	5 x 10½	17½	41 x 64	121⅝	11400
800	8	25	6 x 12½	20	43 x 70	132¼	14700
1100	10	30	6½ x 13	23	50 x 81	159	23000
1500	12	33	7 x 14½	25	53 x 82	171¾	30800
2000	13	36	8 x 16	27½	56 x 87	183⅝	36000

We can also furnish double-framed steam hammers, drop hammers, etc.

UPRIGHT POWER HAMMER.

With all improvements.



These Hammers are heavier in weight and capable of working larger stock than any other Hammer made rated at same size.

The force of the blow is always under control of the operator.

The ram is guided both back and front, preventing side motion.

The dies are adjustable, run perfectly true, and never rest together when idle.

These tools are used for general forging, carriage and wagon work, file and cutlery forging, etc.

Made in eleven sizes that work stock from $\frac{1}{4}$ inch round to $4\frac{1}{2}$ inches round.

SEND FOR CATALOG.

ROCHESTER HELVE HAMMERS.



Size E.

BUILT IN SIX SIZES.

Size	Head Weight, Lbs.	Speed	Weight	Will Work	Horse Power Required	Pulley	Floor Space	Anvil Height, Inches	Price
A	25	400	1250	2 x 2	1 to 2	13½x4	16x60	28	\$200 .00
B	35	400	1500	2½x2½	2 to 2½	13½x4	16x60	28	250 .00
C	50	350	2550	3 x 3	2½ to 3	15x5	20x66	28	500 .00
D	60	300	3300	3½x3½	3½ to 4	16x6	24x75	30	600 .00
E	80	275	3700	4 x 4	4½ to 5	16x6	24x75	30	700 .00
F	100	250	4200	4½x4½	5½ to 6	16x6	24x75	30	850 .00

WRITE FOR DESCRIPTIVE BOOKLET.

MODERN POWER HAMMER.



Height, 5 ft. 3 in.

Floor space, 3 ft. 6 in. x
2 ft. 8 in.

Weight, 1,400 lbs.

Power required, 1 to 2
horse.

Speed, 250 to 350 per
minute.

Pulley, double-flanged, 12
in. dia., 4 inch face.

Weight of ram, 50 lbs.

Stroke, adjustable while
running.

Best suited to 1 1-2 inch
iron and smaller.

Q. & C. POST HAMMERS.

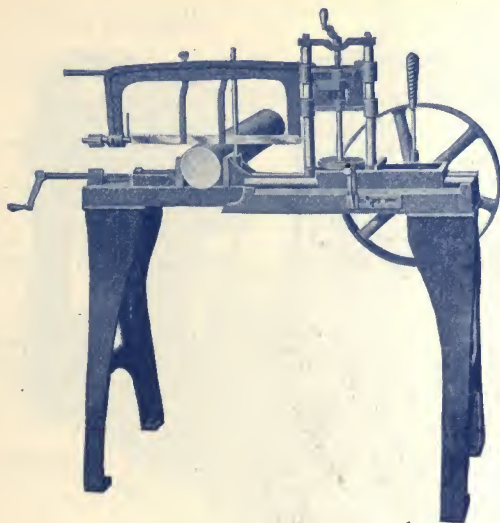
Made in two sizes, for either steam or compressed
air.

Size, lbs.	CYLINDER		Weight, Lbs.	Throat, Inches
	Diam.	Stroke		
100	3	10	1050	10 $\frac{3}{4}$
250	5	18	2950	16

These hammers are not furnished with the post
or column.



Q. & C. POWER HACK SAWS.



Size No.	Capacity in Inches	Floor Space in Inches	Size Saw in Inches	Size of Pulley in Inches	Gross Weight, lbs.	Price
1	4 x 4	18 x 30	12 x $\frac{1}{2}$	14 x $2\frac{1}{2}$	182	\$ 16.75
3	5 x 5	19 x 34	14 x $\frac{3}{4}$ xx	14 x $2\frac{1}{2}$	230	22.50
4	7 x 8	12 x 32	17 x 1	14 x 3	360	45.00
8	3 x 12	15 x 30	10 in. diam.	14 x $2\frac{1}{2}$	450	100.00

All in Chicago stock. Write for discounts.

The No. 1 and No. 3 saws have gravity or power feed. The No. 4 has automatic feed, which is positive and adjustable. The Nos. 3 and 4 saws are furnished with swiveled vise.

Prices are for machines with 6 blades, excepting the No. 8, which includes 2 blades.

MARVEL POWER HACK SAWS.

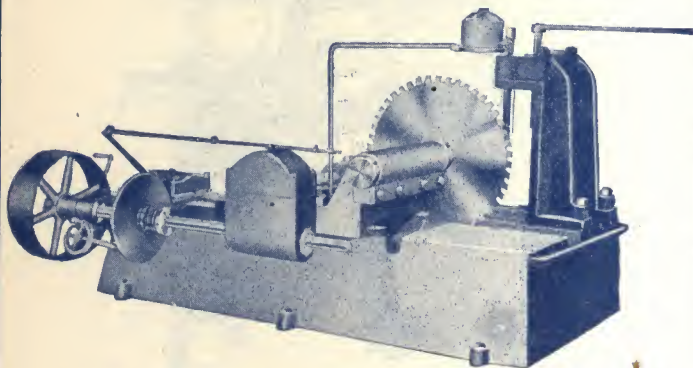


Size No. 1.

Size No.	Capacity	Blade	Speed	Weight	Price
1	4x4 in.	12 in.	60-90	110 lbs.	\$16.75
2	6x6 in.	12 in. to 17 in.	50-70	250 lbs.	35.00

The Marvel is a draw cut hack saw, and on the return stroke the tension releases, relieving the saw. The tension on spring is regulated by a Hand nut. The No. 1 saw is fitted with a quick acting, stationary vise. The No. 2 has a swiveled, quick acting vise, which can be entirely removed, leaving the T-slot table for holding irregular shapes. The No. 2 saw has adjustable stroke from 4 inches to $6\frac{3}{4}$ inches. Both saws are provided with lever to raise and lower saw frame, and this device holds the frame at any angle so that both hands are free to set the work.

Q. & C. METAL SAWING MACHINES. TYPE B

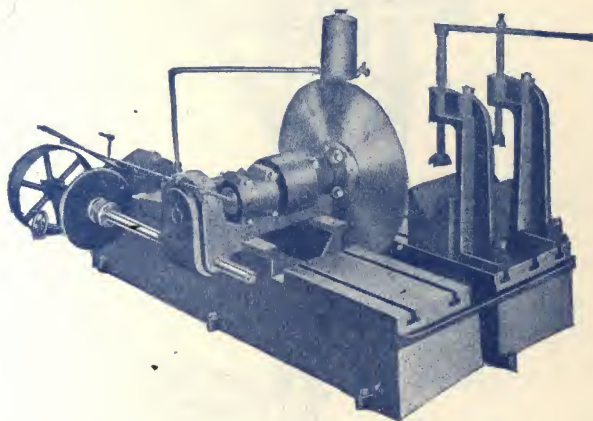


THE BRYANT CUT-OFF TYPE, BELT DRIVEN.

Size	Type	Diam Blade, inches	Saw Travel, inches	Capacity I Beams, inches
2 B	Cut-off	23 1-2	12	15
2 B	Univ.	23 1-2	27	15
3 B	Cut-off	28	12	20
3 B	Univ.	28	30	20
4 B	Cut-off	31 1-4	16	24
4 B	Univ.	31 1-4	36	24

These saws can be mounted on a turntable, and arranged for motor drive, 5 H. P. being required.

The above are the type "B" or Bryant saw, in which the blade is driven by means of tool steel sprocket, meshing into the saw teeth. Can also be furnished with planer head, and adjustable side table, to be used for planing the ends of columns, etc.

Q. & C. METAL SAWING MACHINES.**TYPE A.****TYPE "A" UNIVERSAL SAW.**

Size	Type	Diam. Blade	Saw Travel	Capacity, round
1 A	Cut-off	21 in.	12 in.	6 in.
1 A	Universal	21 in.	27 in.	6 in.
2 A	Cut-off	27 in.	12 in.	8 in.
2 A	Universal	27 in.	30 in.	8 in.
3 A	Cut-off	33 in.	16 in.	10 in.
3 A	Universal	33 in.	36 in.	10 in.

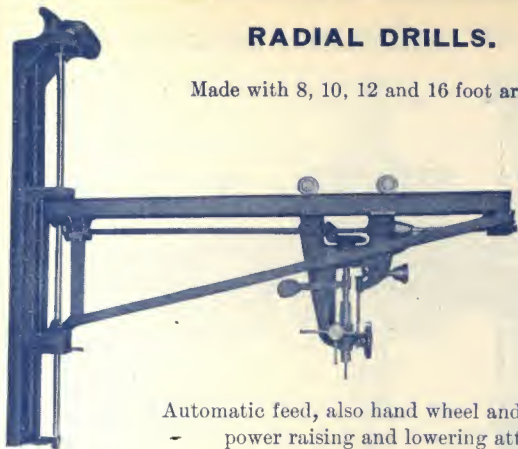
These saws can be furnished motor-driven or mounted on turntable. The type "A" is a fine-tooth saw driven from the arbor, and are recommended for the sawing of rails, etc.

20-INCH UPRIGHT DRILL.**Fig. 860.**

- Fig. 855. Lever feed, round base.
- Fig. 856. Lever feed, square base.
- Fig. 857. Combined wheel and lever feed, round base.
- Fig. 858. Combined wheel and lever feed, square base.
- Fig. 859. Wheel and lever feed, power feed, automatic stop, round base.
- Fig. 860. Wheel and lever feed, power feed, automatic stop, square base.
- Fig. 861. Same as Fig. 859, with back gears.
- Fig. 862. Same as Fig. 860, with back gears.

RADIAL DRILLS.

Made with 8, 10, 12 and 16 foot arm.



Automatic feed, also hand wheel and lever feed with power raising and lowering attachment.

Arm movement, 73 inches. Spindle movement, 8 inches.

Capacity, $1\frac{1}{2}$ -inch twist drill or 4-inch flue hole cutter.

15-FOOT ARM WALL DRILL.



Spindle movement, 6 inch hand lever feed.

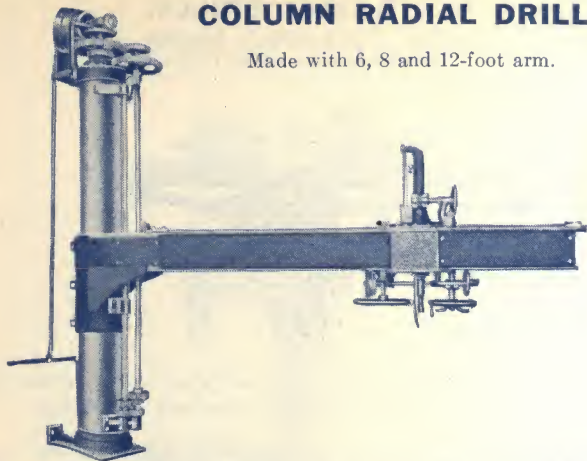
Total length, including bracket, 190 inches.

Traverse of head on arm, 132 inches.

Shortest distance, center of spindle to wall, $37\frac{1}{2}$ inches.

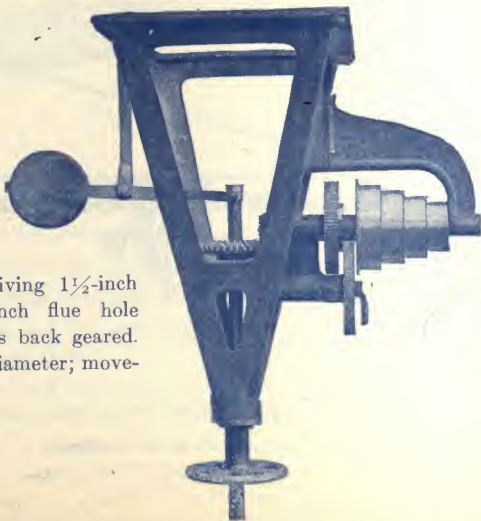
COLUMN RADIAL DRILL.

Made with 6, 8 and 12-foot arm.



These drills have turned cast-iron column resting on ball bearing. Can be furnished either with hand feed or combination hand and power feed for the spindle.

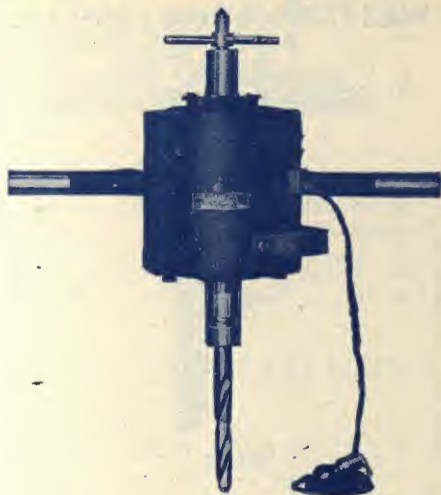
SCULLY SUSPENSION DRILL.



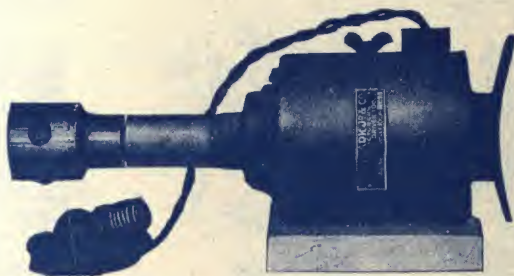
Capacity for driving $1\frac{1}{2}$ -inch twist drill, or 4-inch flue hole cutter. Machine is back geared. Spindle, $2\frac{1}{2}$ -inch diameter; movement, 14 inches.

SEND FOR CATALOG.

WILLEY ELECTRIC DRILLS.



No. 4 Drill, capacity $1\frac{1}{2}$ -inch drill, weight 65 pounds, maximum horse power $\frac{1}{2}$.



Size	No. 1.	No. 2.	No. 3.
Capacity	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$
Weight	$15\frac{1}{2}$	20	21
Speed	1200	700	400-700
Horse Power	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{6}$

Can be furnished for 110 or 220 volt, either direct or alternating current.

SEND FOR CATALOG.

WESTERN CHIEF DRILLS.



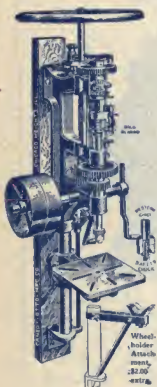
No. 0.



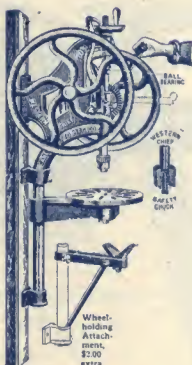
No. 1.



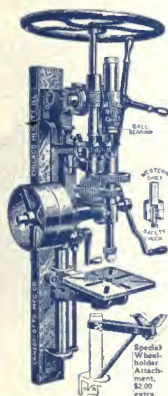
No. 3.



No. 14.



No. 15.

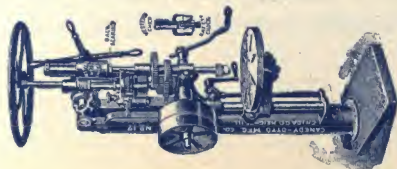


No. 16.

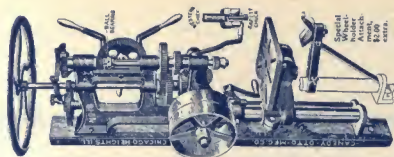
WESTERN CHIEF DRILLS.

TABLE OF SIZES.

Size No.	Throat, In.	Capacity, In.	Driving	Spindle Movement, In.	Table Movement, In.	Weight, Lbs.	Price	
							Hand	Power
0 1/2	9	0 - 3/4	hand	2 3/4	9 1/2	50	\$ 5.50	.....
0	6	0 - 3/4	hand	2 3/4	9 1/2	75	7.50	.....
00	7 1/2	0 - 1 1/4	hand or power	3	10 3/4	110	10.00	\$ 2.00 ex.
1	7 1/2	0 - 1 1/4	hand or power	3	13	130	15.00	2.00 ex.
2	7 1/2	0 - 1 1/2	hand or power	3 1/4	13	125	14.50	2.00 ex.
3	7 1/4	0 - 1	hand or power	3 1/2	11	95	10.00	2.00 ex.
7	10 1/2	0 - 1 1/2	hand or power	5	16 1/2	275	33.50	37.50
12	8	0 - 1 1/2	hand or power	4	15 1/2	215	27.50	31.50
8	11 1/2	0 - 1 1/2	hand	5	20	380	30.00	.....
9	11 1/2	0 - 1 1/2	hand & power	5	20	390	.....	35.00
14	10 1/2	0 - 1 1/2	hand or power	4	16 1/2	295	38.50	42.50
15	9 1/2	0 - 1 1/2	hand or power	4	11 3/4	180	17.50	19.50
16	12	0 - 1 1/2	hand or power	8 1/2	15 1/2	340	42.50	46.50
17	12	0 - 1 1/2	hand & power	8 1/2	15 1/2	560	.....	65.00
18	10 1/2	0 - 1 1/2	hand or power	5 1/2	16 1/2	300	40.50	44.50



No. 17.



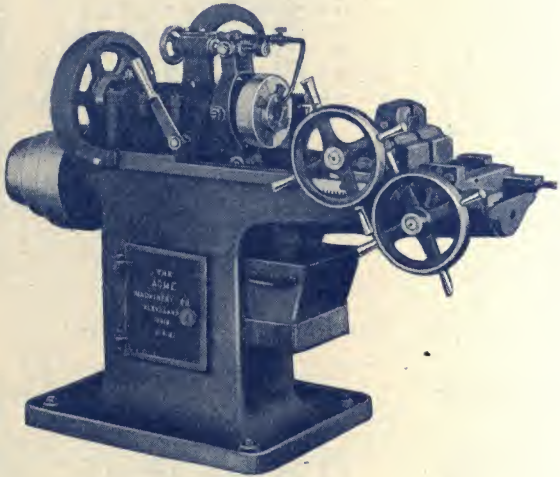
No. 18.

No. 0 1/2 takes bits with 1/2-inch shank. All others can be furnished to take either 1/2 inch or 5/16 inch, size to be specified in ordering.

No. 0 1/2 Drill has hand feed only. All others have combined hand and automatic feed.

Nos. 8, 9 and 17 are floor machines.

BOLT CUTTERS.

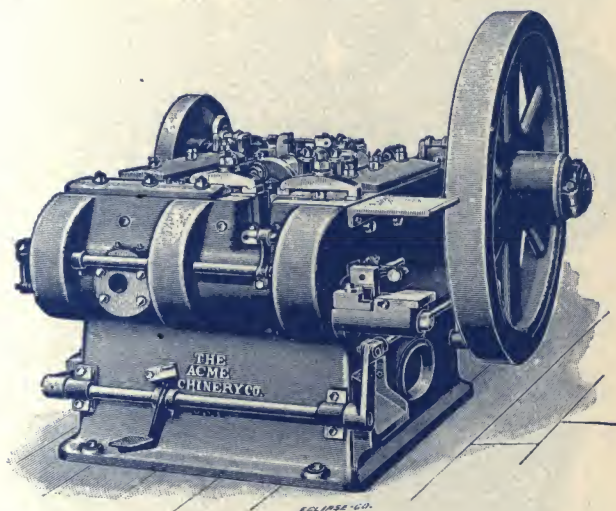


Acme 2-inch Class "A" Single Bolt Cutter.

The Acme Bolt Cutters are built in two styles: Class "B" mounted on legs, in sizes 1 inch, $1\frac{1}{4}$ inch and $1\frac{1}{2}$ inch; Class "A" with cabinet base, in sizes from $\frac{1}{2}$ inch to 6 inches, either single, double or triple head.

The Class "A" is also made for cutting staybolts; the $1\frac{1}{2}$ inch size being made either single or double head.

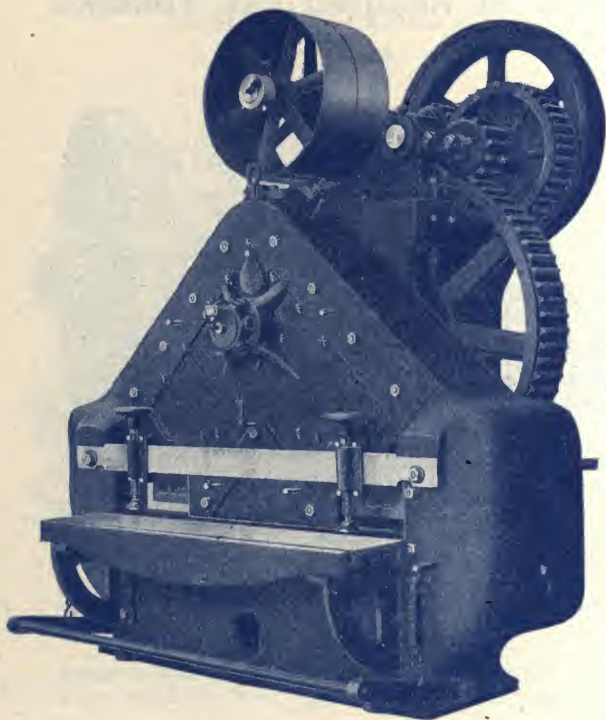
ACME HEADING AND FORGING MACHINES



Standard machines from $\frac{3}{4}$ " to 4" are fitted with double clutch stop motion; automatic relief; ejector; sample set of dies. Up to 2" size are fitted with side shear.

We cannot go into details in this limited space. Send for complete catalog of these tools, in which is also fully illustrated and described the Acme Bolt Cutters.

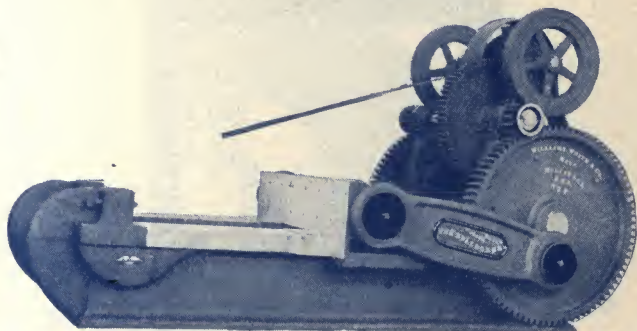
WILLIAMS, WHITE ANGLE SHEARS.



These machines are double, and will cut angles either straight or on a bevel up to 45° .

The slides are steel castings, and machines are powerfully geared.

Can be furnished plain as shown above or motor driven. The motor driven shears are usually mounted on a turntable, so that the machine can be turned when cutting on a bevel.

WILLIAMS, WHITE & CO.'S BULLDOZERS.**No. 7.**

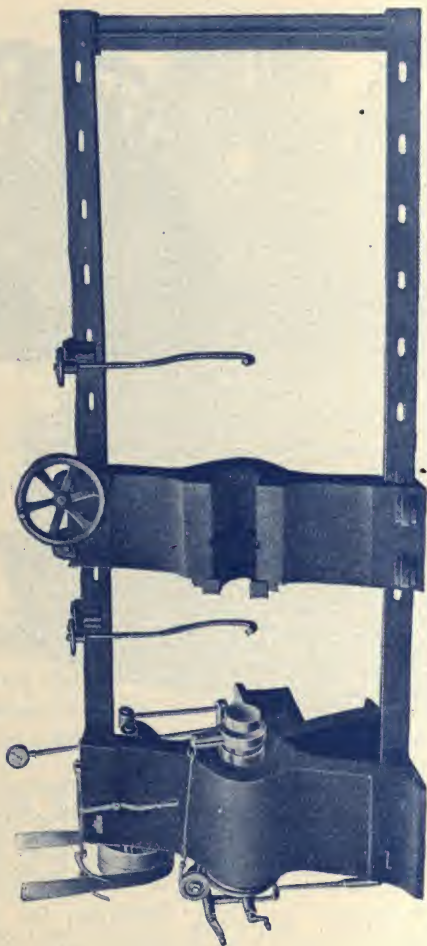
Made in ten sizes, from No. 0, weighing 2,600 lbs., to the No. 9, weighing 64,000 lbs.

The agricultural implement manufacturers use Nos. 2, 3, 4, and occasionally 5 and 6, but most generally 3 and 4. Wagon companies use Nos. 3 and 4. Bridge companies take No. 6 or larger. The railway specialty companies who make brake beams, car trucks, etc., take the larger machines.

Machines can be furnished either single or double geared. Double geared machines made either slow or medium speed. All sizes but the No. 1 have friction clutch.

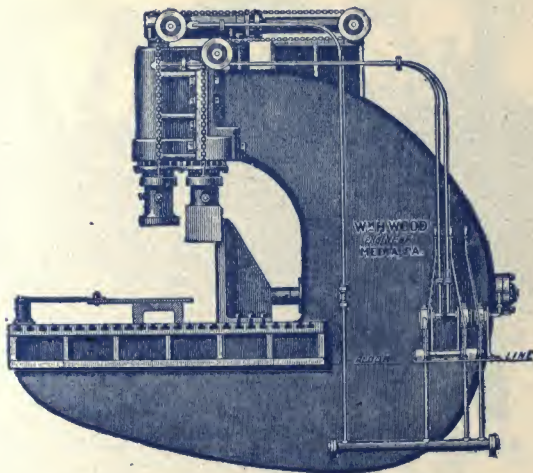
The Williams, White Bulldozers are the standard machines, and have been on the market for forty years.

HYDRAULIC WHEEL PRESS.

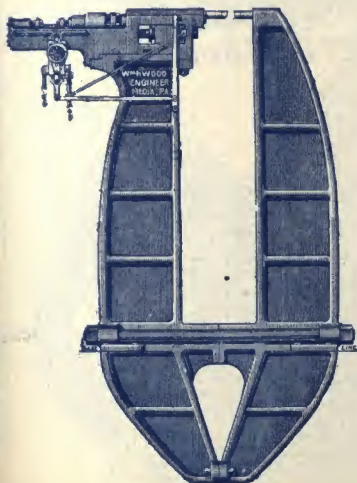


Caldwell Hydraulic Wheel Presses are made in eighteen sizes; from 33 inches between bars, 50 tons capacity, to 68 inches between bars, 350 tons capacity.

The horizontal bars are placed on an angle so that axles with wheels in place can readily be placed in the machine.

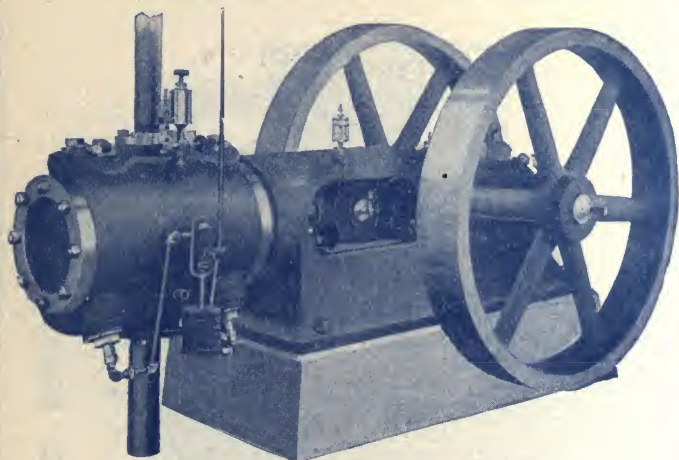
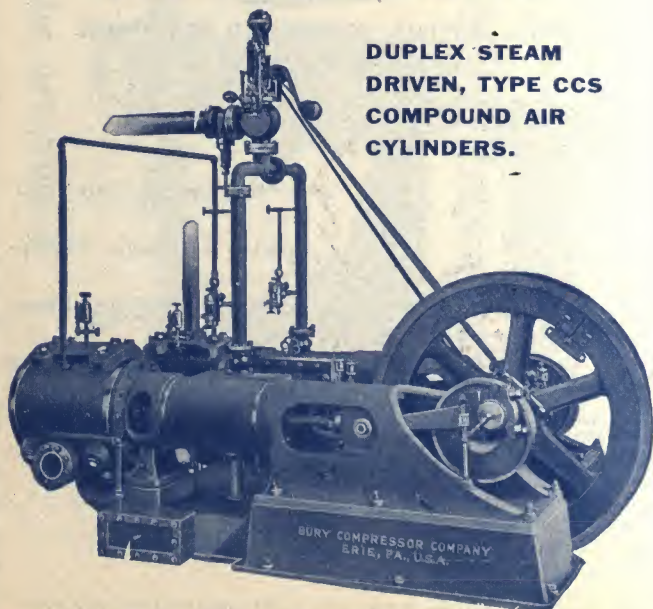
HYDRAULIC MACHINERY.

**60-INCH, 150-TON HYDRAULIC SECTIONAL
FLANGING MACHINE.**



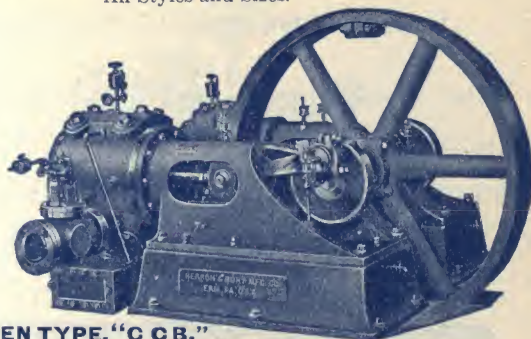
We can furnish Complete Hydraulic Equipments, including Press, Riveter, Pumps, Cranes and Accumulators.

Stake Riveters triple pressure with adjustable stroke.

BURY AIR COMPRESSORS.**Any Type, Any Capacity.****SINGLE BELT DRIVEN, CLASS "B B."****DUPLEX STEAM
DRIVEN, TYPE CCS
COMPOUND AIR
CYLINDERS.****WRITE FOR CATALOG.**

BURY AIR COMPRESSORS.

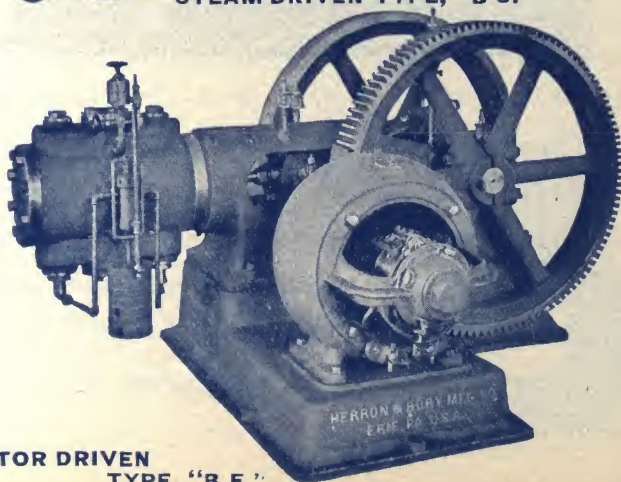
All Styles and Sizes.



BELT DRIVEN TYPE, "C C B."



STEAM DRIVEN TYPE, "B S."

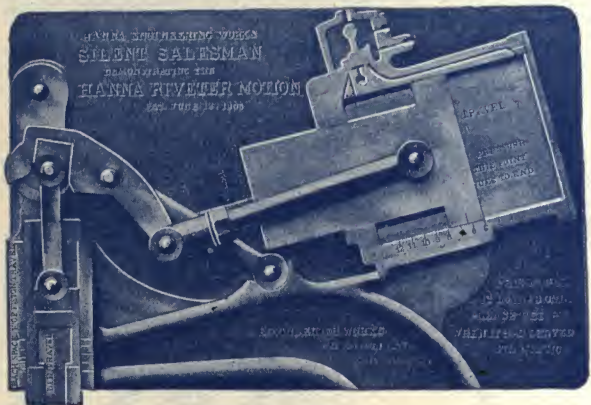


**MOTOR DRIVEN
TYPE, "B E."**

WRITE FOR CATALOG.

HANNA PNEUMATIC RIVETERS.

The Hanna Riveter Motion is demonstrated by means of a model which is termed the "Silent Salesman." This demonstrates better than we can tell in words the powerful mechanism of the Hanna Riveter Motion.



Clearly indicates when toggling action ends and lever action begins, through which a predetermined uniform maximum pressure is exerted on the rivet throughout the last half of the piston travel. The model will be sent to any responsible person interested in riveting. Model, of course, is loaned and is to be returned after it has served its mission.

HANNA PNEUMATIC RIVETERS.

Cut No. 177.

The Hanna Riveters are far superior to the ordinary toggle machine, as the patented system of levers gives a *uniform known* pressure during the last one-half inch of the die travel. This means that for different thicknesses of plate or material being riveted up to one-half inch variation, no adjustment of die is necessary.

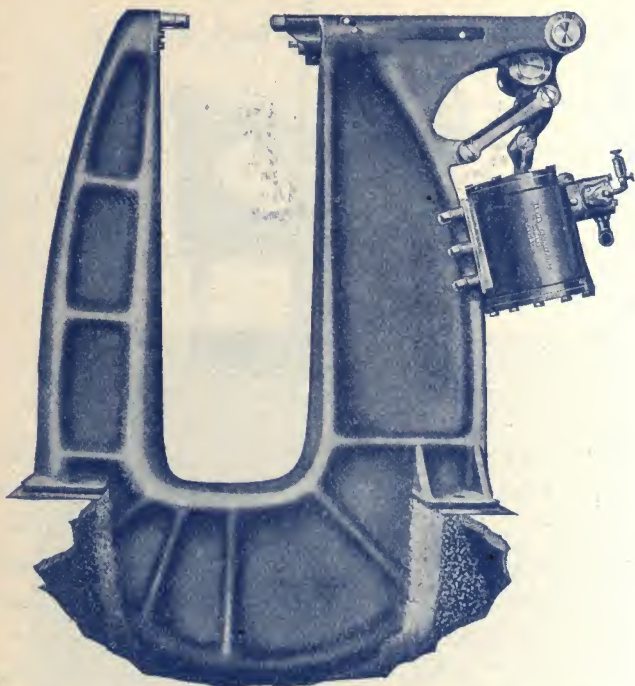
Because of this known pressure it is necessary to close up on the rivet but once, and the saving over the ordinary toggle type is *enormous*. Machines are of the best possible workmanship and material, frames, main levers, guide links, upper toggles, plungers, piston rod heads being steel castings and all working joints bronze bushed.

Machines are built in three capacities, 30, 50 and 70 tons pressure, and any size of throat for portable or stationary machines.

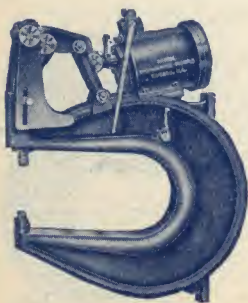


Cut No. 215A.

HANNA PNEUMATIC RIVETERS.



The Hanna type of riveter can be furnished for stationary work. Sizes up to 80 tons pressure, 160-in. reach. Gives hydraulic results with compressed air.



We can also furnish the Hanna plain toggle machine, made in various sizes and capacities. Write for complete catalog.

PORTABLE HEATERS.



Suitable for Locomotive shops, Bridge shops, Boiler shops, etc. For straightening distorted plates, laying up laps, heating sagged ends, there is nothing to compare with these heaters. They are made in two styles: The style "A" is fitted with hand pump, and the style "B" for compressed air.

Type A.

Type B.

No.	Flame	Fuel	Weight	No.	Flame	Fuel	Weight
1	12	Gasoline	40	3	18	Crude or	100
2	15	Kerosene	45	4	24	Refined	130
3	20	Kerosene	100	5	30	Oil	140
4	25	Kerosene	130				

Can be used with one or two burners.

THE SCULLY HOSE COUPLING.

Never allows the hose to become twisted or kinked, reducing the wear and tear on the hose. Cannot itself become disconnected. Never leaks; the higher the pressure the tighter the joint. Instantly disconnected by a combined pull and twist of the sleeve on the male end.



It swivels freely under the highest pressure, allowing the screwing in of connected nipples without disconnecting hose.

Made in the following sizes: $\frac{1}{4}$ in., $\frac{3}{8}$ in., $\frac{1}{2}$ in., $\frac{3}{4}$ in. pipe and hose ends, which are interchangeable with each other. Sizes 1 in. and $1\frac{1}{4}$ in. pipe and hose are interchangeable with each other. In or



Male Hose



Female Hose



Male Pipe



Female Pipe

dering, designate whether hose or pipe, size, and male or female end are wanted.

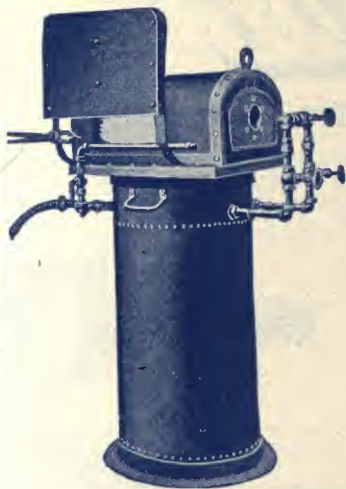
The joint is made by a rubber gasket, U shaped, as shown by the cut. This is very easily replaced when worn out, and is so held in place that it never blows out.



WRITE FOR PRICES.

PORTABLE OIL RIVET FORGE.

Pat. Nov. 26, 1901.



This forge carries a high, soft, uniform heat, always under control of the operator.

Indispensable in connection with pneumatic riveters.

Rivets always in plain sight, quickly heated and easily reached.

Forge will heat rivets up to $1\frac{1}{2}$ in. diameter. Quantity, 500 average size per hour.

Amount of oil consumed, from one to two gallons per hour, depending on number of rivets heated.

Compressed air at 15 lbs. pressure or higher, required to operate, volume from 15 to 20 cubic feet per minute.

Either use fuel oil or kerosene. Forge can also be used for light forging, hardening, tempering and annealing.

THE GUNNELL PNEUMATIC FORGE.

It heats easily 200 rivets per hour.

It has a constant fuel feed.

It consumes only two cubic feet of air per minute, and burns a small amount of fuel per day.

It weighs fifty (50) pounds, about half as much as a hand forge.

It heats 20 rivets at once.

It effects a saving of rivets, and furnishes a smooth hot rivet that is not burned or melted on the end.

The hollow cylinder above the fire contains the fuel, which descends in a highly heated condition and feeds it.

The upper part of the forge is pivoted, thus enabling the operator to reach any rivet by simply revolving the fire bed.

It is the cheapest forge of its kind on the market, and uses small pea coal, hard coal screenings, or coke screenings.

Price, \$15.00, net.



Thor

PNEUMATIC TOOLS.

Made in forty different sizes for drilling, reaming, wood boring, riveting, chipping and calking. All of these tools are of simple construction, run without vibration, and need very little attention or repairs.

Thor CHIPPING AND CALKING HAMMER.

1 in., 2 in., 3 in., 4 in. and
5 in. stroke.



Thor RIVETING HAMMER.

5 in., 6 in., 8 in. and
9 in. stroke.



Thor REVERSIBLE PISTON AIR DRILL No. 25.

For extra heavy drilling, reaming, tapping, flue rolling, and putting in flexible staybolts.

Thor NON-REVERSIBLE DRILLS.

Made in a number of different sizes.



*Thor***CLOSE-QUARTER PISTON
AIR DRILLS.**

These drills are designed for use in extremely close places where the ordinary drill cannot be operated. The dimensions of same are as follows:

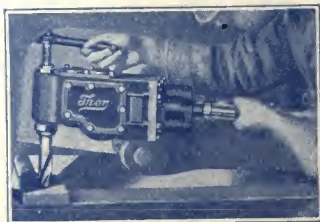
SPECIAL AIR DRILLS.

SIZE	Weight Lbs.	Cubic Feet Free Air per Minute	Length Over All Inches	Distance from Side to Center of Spindle, Inches	Diameter and Stroke of Cylin- der, Inches	Morse Taper Socket	R. P. M.	Size Hose Re- quired, Inches	ADAPTED TO
No. 8 Close Quarter Drill Non-Reversible. . .	26	25	7 $\frac{7}{8}$	1 $\frac{3}{32}$	1 $\frac{11}{16}$ x 1 $\frac{1}{8}$	3	175	$\frac{3}{4}$	Drilling up to 2-in. diam.; reaming and tapping up to 1 $\frac{1}{4}$ -in. diam. in close quarters
No. 9 Close-Quarter Drill Non-Reversible. . .	30	25	8 $\frac{7}{8}$	1 $\frac{9}{32}$	1 $\frac{11}{16}$ x 1 $\frac{1}{8}$	4	122	$\frac{3}{4}$	Drilling up to 3-in. diam.; reaming and tapping up to 2-in. diam. in close quarters

The spindle is at one extreme end of the tool and the motor is at the opposite end. The motor consists of two cylinders parallel with each other, and at right angles to the spindle, center line of both cylinders centering on center of spindle. The pistons are double-acting and operate on a two-throw crank. Between the crank throws at the center are located the eccentrics—cranks and eccentrics being one forging. The eccentric straps operate directly on balanced cylindrical piston valves, having a reciprocating motion. The air is taken in centrally between the cylinders and the valves control the air as close to the cylinder's bore as material will permit. Geared to the crank shaft proper is another two-throw crank, diametrically opposed. This crank operates directly on two oscillating levers centered on the drill spindle proper, and having their bearings around the same. These levers are provided with pawls of practically the whole thickness of the lever. The pawls operate on ratchet teeth sunk in the spindle, the outer circumference, or point of teeth, leaving ample stock for bearings of the levers. The lever's operating crank is arranged to have its power stroke on the part of the revolution farthest away from the spindle. It therefore makes the speed of lever more uniform, pulls forward considerably more than its half revolution, and returns quickly to action. The crank being opposed, the motion of the drill spindle is continuous, with only slight variation. The engine crank proper is not on the usual ninety degree angle, but has an angle of one hundred and thirty-five degrees, thus

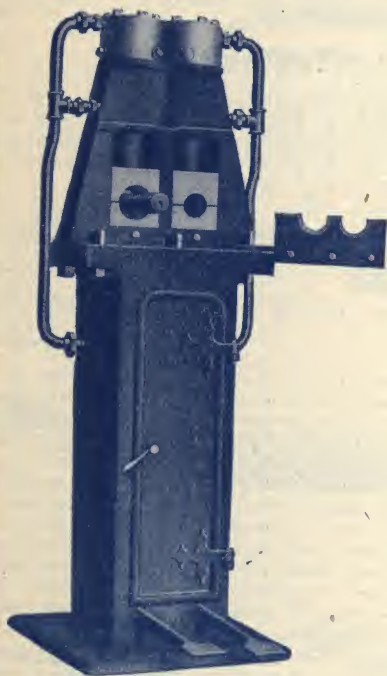
allowing two pistons to pull together when position of levers requires the greatest power. This makes the drill, in a degree, self-regulative, and tends to still further govern the speed of the entire revolution of drill spindle.

This drill is provided with the reversible ratchet feed mechanism, operated within the width of the body of the drill itself. A poppet valve throttle controls the speed and the power to a nicety, and also acts as a handle.



McGRATH PNEUMATIC FLUE WELDER.

A Successful Tool for
Welding, Scarfing and Swedging Boiler Flues.



Made either single or double cylinder, to operate with air at 80 to 100 pounds pressure.

The hammers strike about 2,000 blows per minute. The amount of air used is very small, as the time required for welding is so short.

The capacity of the welder is limited only by the capacity of the heating furnace, welding a 4-inch flue in three seconds, the finished weld being perfect, leaving the flue smooth and even and uniform in thickness.

It will properly scarf both safe and flue end, the scarfing angle being determined by the position in which the flue is held under the hammer.

Each size flue requires a separate set of dies, the changing of flue dies or substituting of swedging dies or scarfing mandrel being done in a moment's time.

The double cylinder machine (see cut above) is especially desirable for railroad work. It will weld and swedge a flue in one heat.

The machine is 4 feet 6 inches high, and occupies a floor space less than 2 feet square.

WRITE FOR BOOKLET OF IRONWORKERS' TOOLS

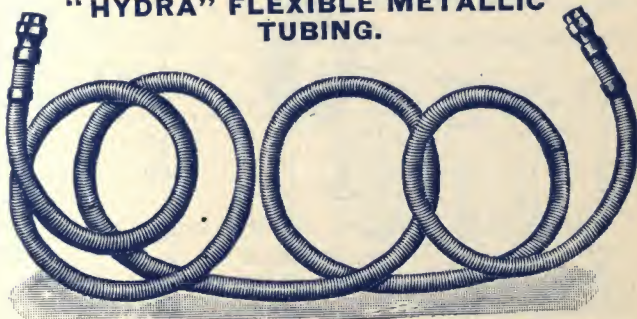
ROCKWELL FLUE WELDING FURNACE.



Air pressure required, 14 to 16 ounces. Uses 7 gallons of oil per hour. Will heat 4-inch tube in from 1 minute to 1 minute and 15 seconds.

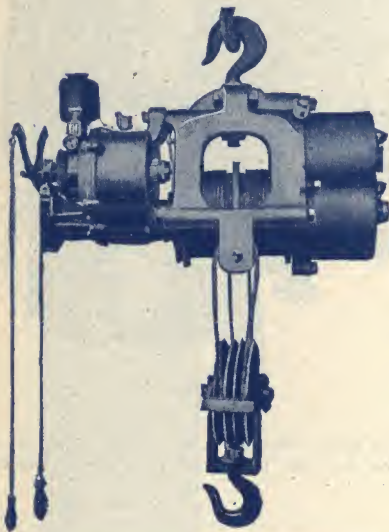
Send for details.

"HYDRA" FLEXIBLE METALLIC TUBING.



* An all metal tubing for air, water, steam or gas. Tubing up to 1 inch carried in stock, with either rubber filament, suitable for air or water, or with asbestos filament for steam or gas. In either single or double type. Will not kink or break.

DETROIT PNEUMATIC GEARED HOISTS.

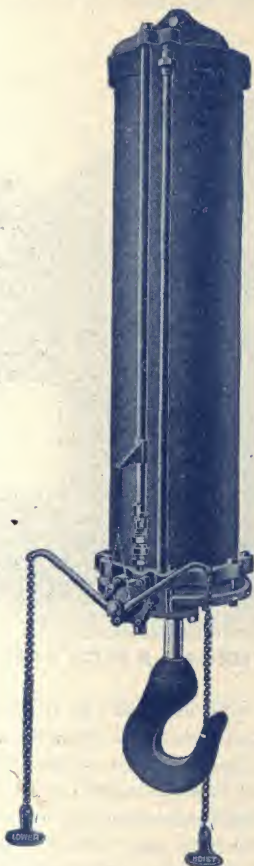


These hoists are made for handling loads up to 10 tons, with the least possible consumption of air, and made as nearly fool proof as possible. The load will be held should the air hose break.

All capacities are based on 80 pounds pressure.

Standard lifts are given in table. Special lifts can be made up to 25 feet.

Size No.	Cap. Tons	Height Lift Feet	Extra Rope Lift per Foot	Speed of Lift per Minute Feet	Shortest Distance between Hooks Inches.	Weight Pounds
1	1	10	0.15	40	30	200
2	1½	10	0.25	25	38	235
3	2	10	0.25	16	38	235
4	3	10	0.30	12	38	275
4½	4	10	0.30	12	38	325
5	5	12	0.45	10	50	565
6	6	12		10	50	720
7	7	12	0.60	8	55	925
	8	12				
8	9	12	0.75	6	55	1000
	10	12				

CURTIS AIR HOISTS.

Class "A," Vertical Hoist. 4 inches to 19 inches
diameter.

Adapted for all kinds of hoisting; have automatic valve, steel upper head, metallic gaskets, and ball and socket hook.

Also made with brackets to be used in horizontal position.

4 feet lift is standard and are carried in stock. Other lengths can be shipped in about three weeks.

PORTABLE PNEUMATIC PUNCH.



6 INCH THROAT, 6 INCH GAP.

For use in punching $\frac{3}{16}$ to $\frac{9}{16}$ inch holes in $\frac{1}{4}$ inch plate, at 90 lb. pressure. A boy with this punch saves the time, expense and trouble of three or four men handling a big sheet in a stationary punch. This is just the punch for copper shops and roundhouses or where light iron work is to be done. By attaching hose to the locomotive, repairs to ash-pans, tanks and front end work can readily be made. Rigged up with special dies, this machine can be used for driving $\frac{1}{4}$ inch rivets in hoops, etc. It will work in the end of $5\frac{1}{2}$ inch diameter pipe. Total stroke of die, $\frac{5}{8}$ inch.

A specially designed cushion in the top-head entirely does away with any shock or blow after punch has cut through plate.

Uses 1.26 cubic feet of free air per stroke.

Furnished with one punch and die, all sizes being interchangeable.

Extra punches and dies to order.

Net Weight.....225 pounds

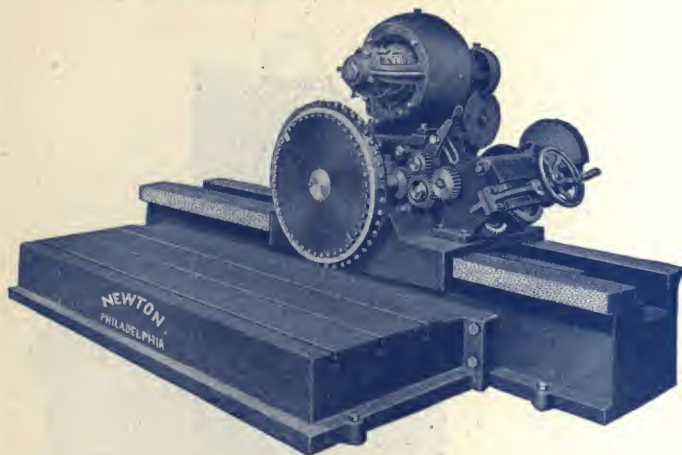
CURTIS SAND BLAST.



The hopper is open, with dust separator. Uses sand over and over again, saving sand, time, and labor.

The Curtis Sand Blast is best. It will do more work in an hour than any other sand blast, and requires less power, sand, labor and repairs than any competing make. It uses air at the standard pressure of from 60 lbs. to 100 lbs. Common building sand only is used. It will clean perfectly work that the ordinary sand blast will not clean at all. It is simpler than any other make. It is light in weight, and can be made portable. The operator has control at all times of the amount of sand and air used. The sand nozzle, a rough grey iron casting, is the only wearing part. There is no wear on the air nozzle, and air consumption is constant. All dust, as well as over-size gravel, is automatically removed. Sand never clogs and does not have to be absolutely dry. Sand hopper can be refilled while blast is at work. It sells for a fraction of the usual cost of a sand blast.

NEWTON ROTARY PLANER.



Made in eleven sizes with cutter head from 26 inches to 100 inches in diameter.

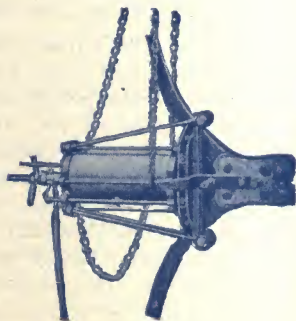
Can be furnished plain, or mounted on turntable.

A very valuable tool for the bridge-builder and structural iron worker.

HELWIG STAY-BOLT NIPPER.

MADE IN TWO SIZES.

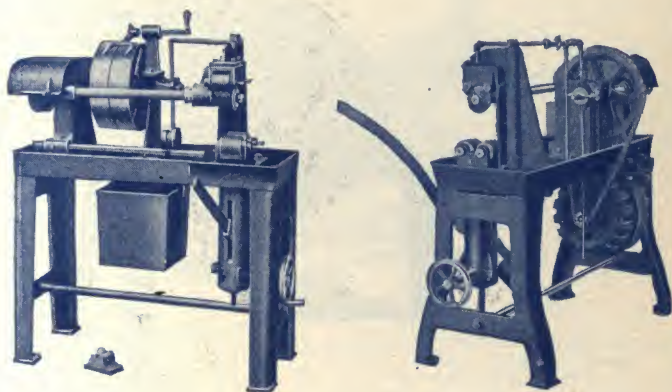
Size	Weight	Capacity
A	210 lbs.	1½ in.
B	170 lbs.	1¼ in.



The clippers, or nippers, cut with ease and rapidity up to their capacity. It cuts the bolts off square and smooth, without jar, leaving them as tight as when put in. As it cuts from the side, any length of bolt can be cut off, and allows the operator to see the work. Capacity, with helper and boy, about seven hundred stay-bolts per hour.

SEND FOR COMPLETE CATALOG.

FOX TUBE AND PIPE CUTTER.



Cuts show No. 6 heavy machine, both belt driven and motor driven, with silent chain drive.

The pipe or tube is supported on two hardened rollers, immediately under the cutting disc. In Nos. 5 and 6, the rollers are adjusted vertically. In No. 1, the cutter is adjusted.

Size	Maximum Capacity	Minimum Capacity	Pulleys	Speed	Cutter	Net Weight, Pounds.
1	2	$\frac{3}{8}$	$8 \times 2\frac{1}{2}$	175	$2\frac{1}{2}$	105
5	$2\frac{1}{2}$	$\frac{5}{8}$	12×3	450	3	460
6	$4\frac{1}{2}$	$\frac{3}{8}$	$14 \times 4\frac{1}{4}$	300	4	865

No. 1 is a bench machine.

LONG BLADE HAND LEVER SHEARS.



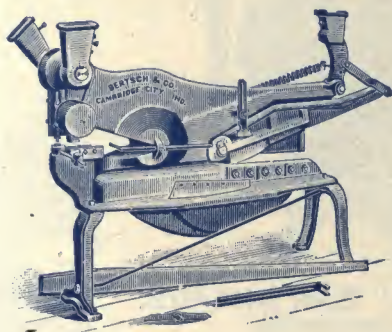
No.	Blades	Cuts	Bars	Round	Pounds
1	15 in.	No. 14	$\frac{1}{4} \times 2$	$\frac{1}{2}$ in.	300
2	15 in.	No. 10	$\frac{3}{8} \times 2$	$\frac{1}{16}$ in.	375
2C	15 in.	No. 8	$\frac{7}{16} \times 2$	$\frac{5}{8}$ in.	410
3	10 in.	No. 6	$\frac{7}{16} \times 2$	$\frac{5}{8}$ in.	350
4	12 in.	$\frac{1}{4}$ in.	$\frac{1}{2} \times 3$	$\frac{3}{4}$ in.	550
4D	12 in.	$\frac{5}{16}$ in.	$\frac{9}{16} \times 3$	$\frac{7}{8}$ in.	650
7	18 in.	$\frac{1}{4}$ in.	$\frac{9}{16} \times 3\frac{1}{2}$	$\frac{7}{8}$ in.	1000
7E	12 in.	$\frac{3}{8}$ in.	$\frac{5}{8} \times 3\frac{1}{2}$	1 in.	1200

VIKING PORTABLE BENCH SHEARS.

Capacity $\frac{3}{16}$ in. plate.
Blades $5\frac{1}{2}$ in. long.
Made of malleable iron.
Blades are removable.



COMBINED PUNCH AND SHEAR.



No.	Throat	Will Punch	Blade	To Cut	Bars	Round	Weight
2	4 in.	$\frac{1}{4}$ in $\frac{1}{4}$	10 in.	No. 12	$\frac{1}{4} \times 1$	$\frac{3}{8}$	240
3	6 in.	$\frac{5}{16}$ in $\frac{1}{4}$	10 in.	No. 10	$\frac{1}{4} \times 1\frac{1}{2}$	$\frac{1}{2}$	300
4	8 in.	$\frac{5}{16}$ in $\frac{1}{4}$	15 in.	No. 10	$\frac{1}{4} \times 2$	$\frac{9}{16}$	450
5H	10 in.	$\frac{3}{8}$ in $\frac{3}{8}$	15 in.	No. 8	$\frac{3}{8} \times 2$	$\frac{5}{8}$	575
5	12 in.	$\frac{5}{16}$ in $\frac{5}{16}$	12 in.	No. 8	$\frac{3}{8} \times 2$	$\frac{5}{8}$	525
6	8 in.	$\frac{3}{8}$ in $\frac{3}{8}$	12 in.	No. 6	$\frac{1}{2} \times 2\frac{1}{2}$	$\frac{3}{4}$	640
8	12 in.	$\frac{3}{8}$ in $\frac{3}{8}$	12 in.	$\frac{1}{4}$ inch	$\frac{1}{2} \times 3$	$\frac{3}{4}$	800
10	18 in.	$\frac{3}{8}$ in $\frac{1}{4}$	18 in.	No. 10	$\frac{1}{2} \times 2\frac{1}{2}$	$\frac{5}{8}$	1050
10A	15 in.	$\frac{3}{8}$ in $\frac{3}{8}$	15 in.	No. 6	$\frac{1}{2} \times 3$	$\frac{3}{4}$	1150
12	15 in.	$\frac{1}{2}$ in $\frac{1}{2}$	12 in.	$\frac{5}{16}$ inch	$\frac{5}{8} \times 2\frac{1}{2}$	$\frac{7}{8}$	1200
12B	12 in.	$\frac{5}{8}$ in $\frac{1}{2}$	12 in.	$\frac{5}{16}$ inch	$\frac{5}{8} \times 3$	$\frac{7}{8}$	1275
18	20 in.	$\frac{1}{2}$ in $\frac{1}{2}$	24 in.	$\frac{5}{16}$ inch	$\frac{1}{2} \times 3\frac{1}{2}$	$\frac{7}{8}$	1850
18C	20 in.	$\frac{5}{8}$ in $\frac{1}{2}$	24 in.	$\frac{3}{8}$ inch	$\frac{5}{8} \times 3\frac{1}{2}$	1	2100
18D	18 in.	$\frac{3}{4}$ in $\frac{1}{2}$	24 in.	$\frac{3}{8}$ inch	$\frac{5}{8} \times 4$	.1	2200

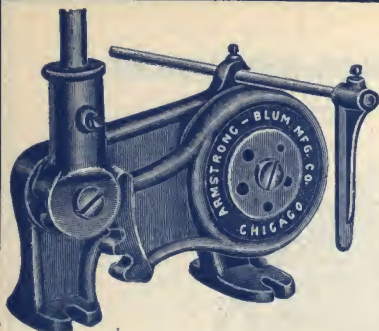


No. 40 1-2 HAND LEVER SHEARS.

Capacity, $\frac{3}{8}$ -inch plate or
 $4 \times \frac{1}{2}$ -inch bars.

Blades, $7\frac{1}{2}$ inches long.

Weight, 675 lbs.



MARVEL ROD CUTTERS.

No.	Capacity.	Weight.
5	$\frac{3}{8}$ in. rd.	12 lbs.
6	$\frac{1}{2}$ in. rd.	35 lbs.
7	$\frac{3}{4}$ in. rd.	95 lbs.

Machines have openings for 5 sizes of rounds up to capacity.

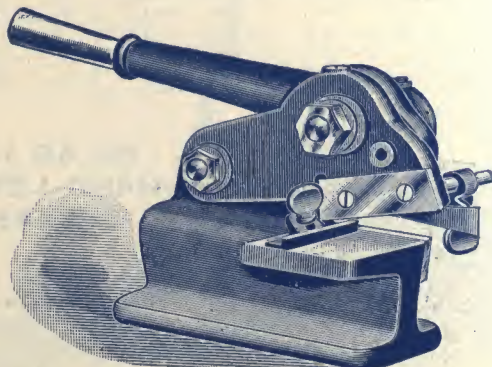
TYPE "B" BAR SHEARS.

No.	Capacity		Weight
	Flat	Round	
A- 1	$\frac{3}{8} \times 3$	...	75
A- $1\frac{1}{2}$	$\frac{3}{8} \times 3$	$\frac{3}{4}$	90
A- 2	$\frac{1}{2} \times 2$	...	150
A- $2\frac{1}{2}$	$\frac{1}{2} \times 2$	$\frac{7}{8}$	165
A-10	$\frac{5}{8} \times 5$	$1\frac{1}{4}$	700



A-10.

MOON HAND LEVER SHEAR.

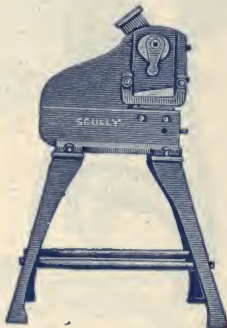


Will shear $\frac{1}{8}$ in. sheets, or $\frac{5}{16}$ in. round. Weight 20 pounds.

SCULLY HAND-POWER SHEARS. FOR PLATES AND SHEETS.



No. 1. Capacity, $\frac{1}{8}$ -in. plate.
Blade, $4\frac{1}{2}$ inches long. Weight,
100 pounds.



No 2. Capacity, $\frac{3}{16}$ -in. plates.
Blade, $5\frac{1}{2}$ inches long. Weight,
200 pounds.



No. 3. Capacity, No. 12 steel.
Blade, $14\frac{1}{2}$ inches long. Weight,
300 pounds.

No. 4. Cast steel body.
Capacity, $\frac{5}{16}$ -in. plates. Blade,
 $6\frac{1}{2}$ inches long. Weight, 250
pounds.



No. 16. Capacity, $\frac{1}{2}$ -in. plate.
Blade, $10\frac{1}{2}$ inches long. Weight,
1,200 pounds.

HAND POWER TOOLS. BUFFALO ANGLE SHEARS.



Light and Compact.

Cut is a shearing cut so that one man can easily shear up to the capacity of the machine.

Built in two sizes:

No.	Capacity	Weight
1	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$	150 lbs.
2	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$	200 lbs.

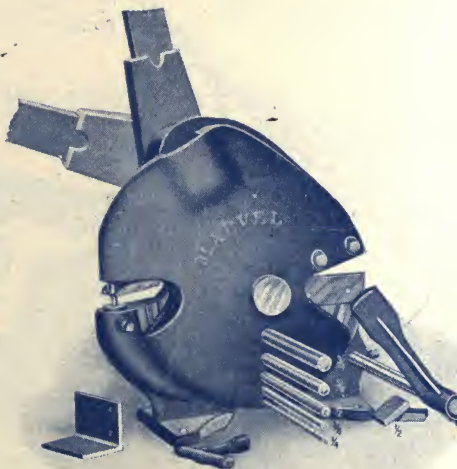
THE MARVEL COMBINED PUNCH AND SHEAR.

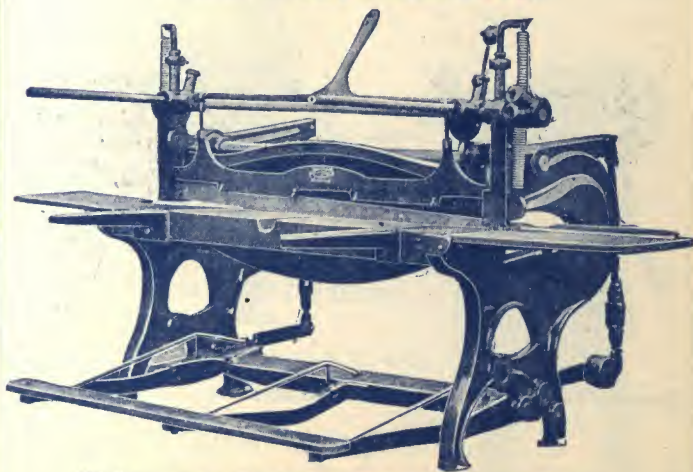
Capacity $\frac{3}{4}$ -in. round, $2 \times \frac{1}{2}$ -in. flat bars.

Will punch $\frac{3}{8}$ -in. hole in $\frac{3}{8}$ -in. plate.

All parts of this tool are made to jigs and are interchangeable.

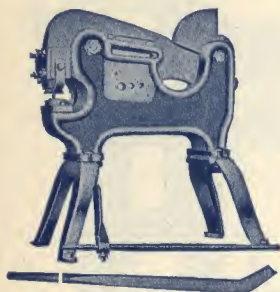
Frame is of malleable iron.



FOOT POWER SQUARING SHEARS.**Tinners' Shears without Throat.****50-inch Gap Shears, Capacity No. 14 Gauge.**

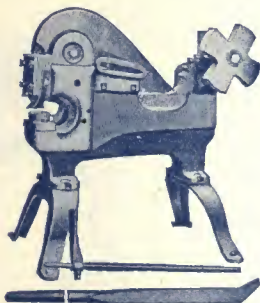
Above shears can be furnished in a number of sizes and capacities.

TYPE "B" COMBINATION PUNCHES AND SHEARS.

**No. 33**

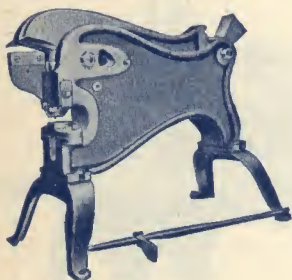
Shears, $\frac{7}{8}$ in. Round Bars.
 $\frac{1}{2} \times 2\frac{1}{2}$ in. Flat Bars.

Punch, 3 in. Throat.
Capacity, $\frac{3}{8}$ in. Hole in $\frac{3}{8}$ in. Plate.
Weight, 310 lbs.

**No. 66.**

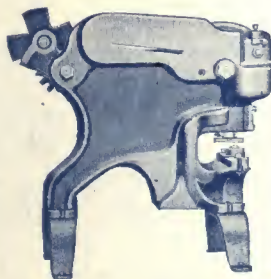
Shears, 1 in. Round Bars.
 $\frac{1}{2} \times 4$ in. Flat Bars.

Punch, 3 in. Throat.
Capacity, $\frac{1}{2}$ in. Hole in $\frac{1}{2}$ in. Plate.
Weight, 510 lbs. •

**No. 6.**

Shears, 1 in. Round Bars.
 $\frac{1}{2} \times 4$ in. Flat Bars.

Punch, 3 in. Throat.
Capacity, $\frac{1}{2}$ in. Hole in $\frac{1}{2}$ in. Plate.
Weight, 570 lbs.

**No. 15.**

Shears, 1 in. Round Bars.
 $\frac{1}{2} \times 4$ in. Flat Bars.
 $7 \times \frac{1}{4}$ in. Band Iron.

Punch, 7 in. Throat.
Capacity, $\frac{5}{8}$ in. Hole in $\frac{1}{2}$ in. Plate.
Weight, 800 lbs.

HAND POWER TOOLS.**MARVEL PUNCHES.**

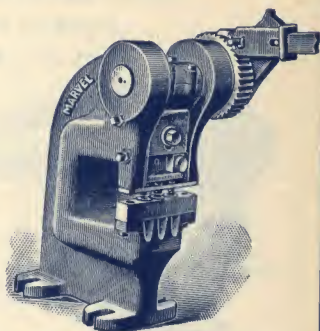
No.	Capacity	Throat	Est. Wt.
10	$\frac{5}{16} \times \frac{1}{4}$	4 in.	90 lbs.
11	$\frac{7}{16} \times \frac{3}{8}$	5 in.	300 lbs.
12	$\frac{8}{8} \times \frac{1}{2}$	6½ in.	675 lbs.

Nos. 10 and 11 have four punches and dies.

No. 12 has three punches and dies.

The die block and throat of these machines are made to allow the punching of small structural shapes.

Either punch can be used by inserting the tool steel block.

**TURRET PUNCH.**

This is really four punches in one. The punch head has four slides, which can hold four different sizes of punches and dies, and any one punch can be easily moved into operating position.

Throat, 1½ in.; capacity, ¼ in. hole through ¼ in. plate.

**TYPE "B" COMBINED PUNCH AND SHEAR.**

No. 9 Machine. Will split plates ¼ in. and lighter, of any length or width.

Blades, 6½ in. long.

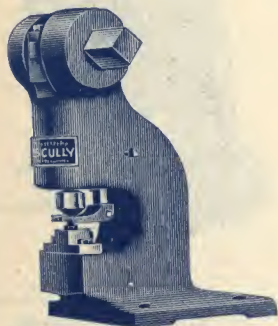
Punch side, 6 in. throat; capacity, ⅜ in. hole through ⅜ in. plate.

Weight, 550 lbs.



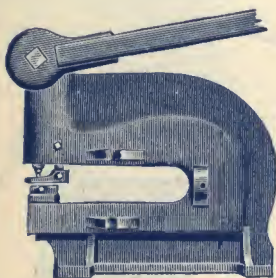
HAND-POWER TOOLS.

SCULLY LEVER PUNCHES.



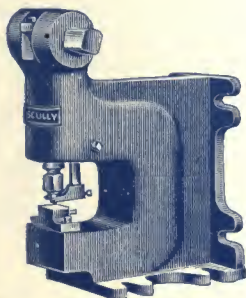
No. 1. 2½-in. throat. Capacity, ¼-in. hole in ¼-in. plate. Weight, 70 lbs.

No. 4. 5-in. throat. Capacity, ½-in. hole in ¼-in. plate. Weight, 143 lbs.

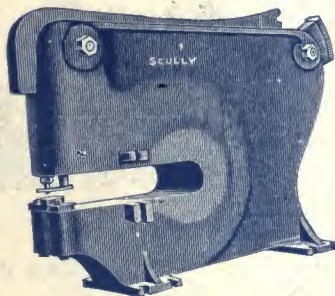


No. 3. 16-in. throat. Capacity, ⅝-in. hole in No. 10 steel. Weight, 182 lbs.

No. 5. 15-in. throat. Capacity, ¼-in. hole in ⅜-in. plate. With staybolts in has 7½-in. throat and punches ½-in. in ¼-in. plate. Weight, 446 lbs.



No. 2. 4-in. throat. Capacity, ⅝-in. hole in ¼-in. plate. This machine can be bolted to a bench or wall post. Weight, 90 lbs.



No. 6. 7½-in. throat. Capacity, ½-in. hole in ½-in. plate. Weight, 500 lbs.

No. 7. 15-in. throat. Capacity, ¾-in. hole in ½-in. plate. Weight, 2,000 lbs.

No. 8. 24-in. throat. Capacity, ¾-in. hole in ½-in. plate. Weight, 2,500 lbs.

No. 9. 30-in. throat. Capacity, ¾-in. hole in ½-in. plate. Weight, 3,300 lbs.

PORTABLE HAND PUNCHES. WHITNEY DROP FORGED.

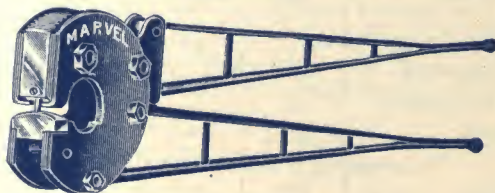


No. 2. Weight 11 pounds, Length 23 inches, Throat $1\frac{1}{8}$ inches,
Capacity $\frac{3}{8}$ -inch hole, $\frac{1}{4}$ -inch plate.

Parts are drop forged. Punches can be easily changed without removing any bolts. This is a light strong tool, very valuable for outside work, as well as for the shop.

A special vise can be furnished for bench work; weight of vise 5 lbs.

MARVEL ALL STEEL PUNCH.

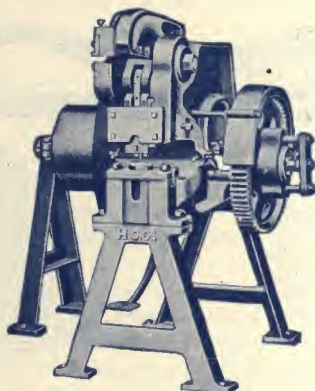


No. 20. Weight 16 pounds, Length 38 inches, Throat 2 inches
Capacity $\frac{1}{4}$ -inch hole, $\frac{1}{4}$ -inch plate.

All parts are of steel. The segmental gears for operating the slide are case hardened. Punch can be held in ordinary machinist's vise.

Both of the above punches will take punches and dies up to $\frac{1}{2}$ -inch diameter.

TYPE "B" POWER COMBINED PUNCH AND SHEAR.



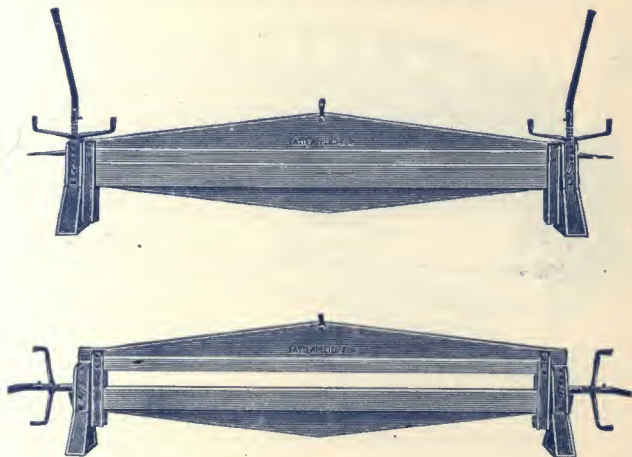
No. 10 1/2

Size No.	10	10 1/2	12	17
Will Shear Band Iron.....	.....	5x3/4	6x3/4	.....
Will Shear Flat Bars.....	1/2x3	1/2x4	3/4x4 1/2	7/8x4 1/2
Will Shear Round Bars...	1	1	1 1/4	1 3/4
Punch Capacity	1/2x3/8	5/8x1/2	3/4x5/8	1x3/4
Throat	6	6 1/2	7	10
Pulley Speed.....	200	225	200	200
Weight	1200	1575	2700	4700

In these machines the main frame and lever are planed and accurately fitted.

Machines can be fitted with architectural jaw, or angle shearing attachment.

QUICK ACTING FLANGING CLAMPS.



The greatest objection with a flanging clamp operated by hand has been the loss in heat caused by the slow operation of lowering the upper section to clamp the work. This has been overcome in this machine, as the thinnest plate can be clamped. By pulling the levers from a vertical to a horizontal position, the upper section will raise six inches in the clear, leaving plenty of room to enter the work. The levers can be placed in different positions if desired, and if the lever bolts are placed in the top hole, the clamp will open twelve inches and lower down to six inches. This facilitates the use of other forms on top of lower section and still have the use of clamping the work quickly.

STANDARD CLAMPS.

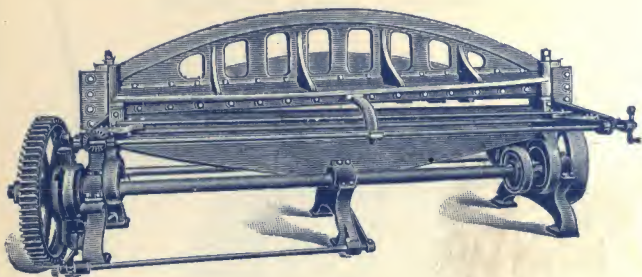
Length.....	8 ft.	10 ft.	12 ft.
Weight, lbs.....	2350	2800	3500

EXTRA HEAVY CLAMPS.

Length.....	14 ft.	16 ft.
Weight, lbs.....	5200	5900

Can also be furnished to operate by air.

POWER SQUARING SHEARS.



Blades, 10 ft. 4 in. long. Capacity, No. 10 soft steel.

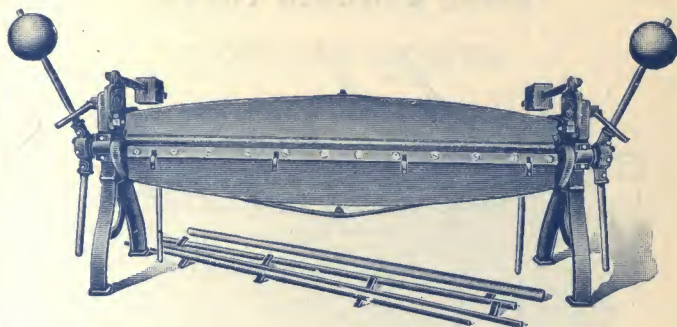
Proportion of gearing, 7 to 1.

Speed of fly wheel, 175 R. P. M.

Made also in 3, 6 and 8 ft. sizes.

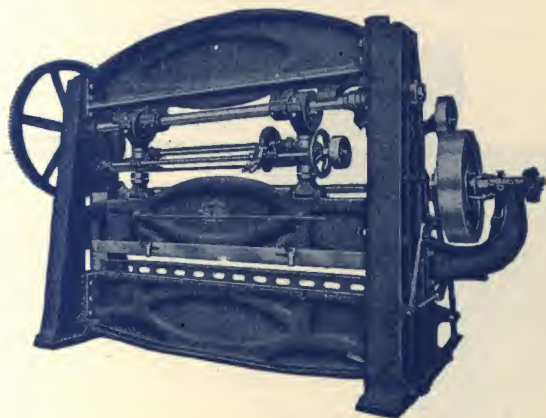
These shears are built from new patterns of modern design, are self-containing and are **VERY POWERFUL**. The knife head has been made exceptionally strong to **PREVENT SPRINGING** and has wide bearings scraped to a proper fit with gibs in the guides for adjustment to compensate for wear. The side guides and legs are in one piece of heavy casting. Our improved automatic clutch mechanism with brake attachment is so arranged that the knife head will stop at the top of each stroke automatically or will run continuously if the foot is kept on the treadle. The working parts of this clutch are of **TOOL STEEL** and the clutch-pin engages at two different stops directly opposite each other in the hub of the large gear so that no delay is caused in making each cut. The clamp, or hold-down, holds the sheet firmly while the cut is being made, thus insuring accuracy. Front, back and side gauges are provided, the back gauge being automatic and attached to the knife head and is adjustable from either end of the machine by means of screws and mitre gears and is **ALWAYS PARALLEL** to the knives. A brass rule, graduated to 1-16ths, is also attached to the gauge and an indicator facilitates the setting. All bearings and parts are **ADJUSTABLE**. The blades are ground perfectly true on a special machine and any wear is compensated for by the adjustment of the table.

DOUBLE CAM BRAKE.



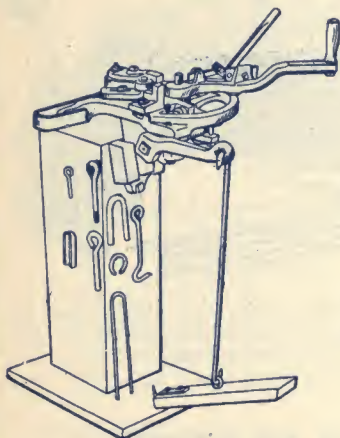
Cut shows 8-foot brake. Capacity No. 18 iron, weight 3,200 lbs. Other sizes in proportion. This brake is steel-faced throughout. Can be operated at either end, independently of the other.

POWER PRESS OR BRAKE.



Ten feet long, capacity No. 10 gauge; various sizes, weighing from 20,000 lbs. to 90,000 lbs. Write for descriptive matter, sending drawing or sample of work to be done.

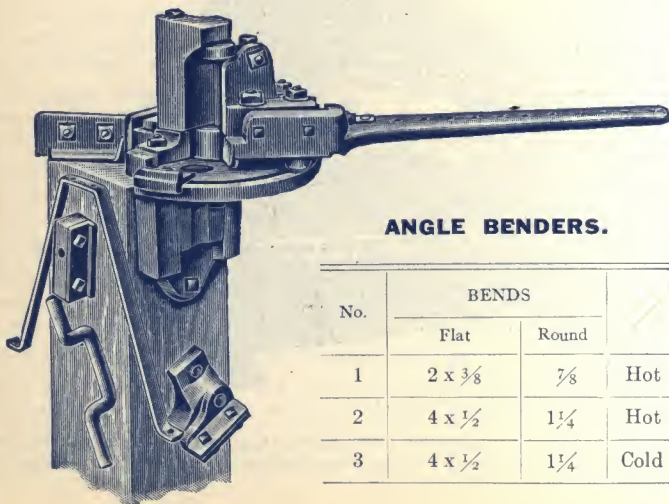
HAND BENDING TOOLS.



EYE BENDERS.

No. 1 takes stock up to $\frac{1}{2}$ -inch round. Bends rings up to $2\frac{3}{4}$ -inch outside diameter.

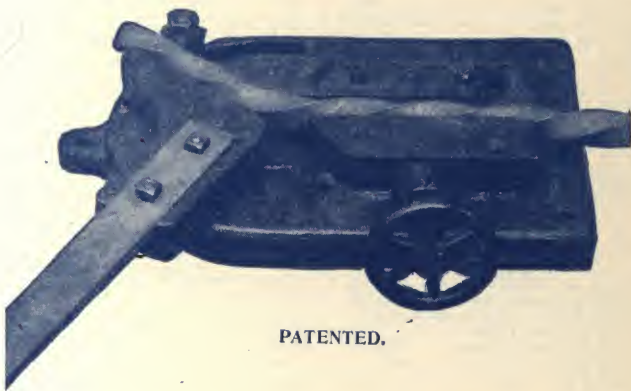
No. 2 takes stock up to $\frac{3}{4}$ -inch round. Bends rings and eyes up to 3-inch outside diameter.



ANGLE BENDERS.

No.	BENDS		
	Flat	Round	
1	2 x $\frac{3}{8}$	$\frac{7}{8}$	Hot
2	4 x $\frac{1}{2}$	1 $\frac{1}{4}$	Hot
3	4 x $\frac{1}{2}$	1 $\frac{1}{4}$	Cold

ACME BAR BENDER.



PATENTED.

The Acme Bar Bender is made of steel throughout. We do not depend upon a pin to hinge our lever. The Acme has a large machined steel turn table.

The clamp, by means of which the bar is held in place, is a block of steel adjusted by $1\frac{1}{4}$ inch screw with a wheel handle. This cannot get out of order and can be adjusted instantly.

The gauge is so arranged in a slot that it cannot become lost or out of order. It can be set to bend the bar at any angle without delay.

If you want a guarantee draw one and we will sign it.

What you are looking for is a simple, sturdy, practical bender that any workman can use. This is why you want the Acme because it is just this and nothing else.

It will last a life time.

STANDARD STEEL CLASSIFICATION.

Extras are given in cents per pound.

ROUNDS AND SQUARES.

$\frac{3}{4}$ to $3\frac{1}{16}$ inches.....	Base	$\frac{7}{32}$ inch.....	\$2.00 extra
to $\frac{1}{4}$ inch.....	\$0.10 extra	$\frac{1}{16}$ inch.....	2.50 extra
to $\frac{9}{16}$ inch.....	.20 extra	$3\frac{1}{4}$ to $3\frac{9}{16}$ inches.....	.15 extra
$\frac{1}{2}$ inch.....	.40 extra	$3\frac{3}{8}$ to $4\frac{1}{16}$ inches.....	.25 extra
$\frac{5}{8}$ inch.....	.50 extra	$4\frac{1}{8}$ to $4\frac{9}{16}$ inches.....	.30 extra
$\frac{3}{4}$ inch.....	.60 extra	$4\frac{3}{8}$ to 5 inches.....	.40 extra
$\frac{7}{8}$ inch.....	.70 extra	$5\frac{1}{8}$ to $5\frac{1}{2}$ inches.....	.50 extra
$1\frac{1}{8}$ inch.....	.80 extra	$5\frac{3}{8}$ to 6 inches.....	.75 extra
$1\frac{1}{4}$ inch.....	1.00 extra	$6\frac{1}{8}$ to $6\frac{1}{2}$ inches.....	1.00 extra
$1\frac{3}{4}$ inch.....	1.50 extra	$6\frac{3}{8}$ to $7\frac{1}{4}$ inches.....	1.25 extra

For intermediate sizes, the next higher extra to be charged in all cases.

SMALL CHANNELS.

$1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{3}{16}$ inch and heavier.....	\$0.20 extra
$1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{1}{8}$ inch.....	.30 extra
1 to $1\frac{1}{4}$ inches x $\frac{3}{16}$ inch and heavier.....	.30 extra
1 to $1\frac{1}{4}$ inches x $\frac{1}{8}$ inch.....	.40 extra
x $\frac{3}{16}$ inch and heavier.....	.40 extra
x $\frac{1}{8}$ inch.....	.50 extra
to $\frac{1}{4}$ inch x $\frac{3}{16}$ inch.....	.50 extra
x $\frac{1}{8}$ inch.....	.60 extra
x $\frac{1}{4}$ inch.....	2.20 extra
x $\frac{1}{2}$ inch.....	3.20 extra
x less than $\frac{1}{8}$ inch.....	3.60 extra

For intermediate sizes, the next higher extra to be charged in all cases.

SMALL ANGLES.

Angles are now divided into two classes. Angles having either leg 3 inches or larger, $\frac{1}{4}$ inch thick or heavier, are structural angles.

Angles having either leg 3 inches or larger, $\frac{3}{16}$ inch thick or lighter, are small angles.

Angles having both legs under 3 inches are small angles.

Below we give classification on small angles.

$1\frac{1}{2}$ x $1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{3}{16}$ inch and heavier.....	\$0.20 extra
$1\frac{1}{2}$ x $1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{1}{8}$ inch.....	.30 extra
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ inches, x $\frac{3}{16}$ inch and heavier.....	.30 extra
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ inches, x $\frac{1}{8}$ inch.....	.40 extra
x $\frac{3}{16}$ inch.....	.40 extra
x $\frac{1}{8}$ inch x $\frac{1}{8}$ inch.....	.50 extra
x $\frac{3}{16}$ inch x $\frac{1}{8}$ inch.....	.50 extra
x $\frac{1}{8}$ inch x $\frac{1}{8}$ inch.....	.60 extra
x $\frac{3}{16}$ inch x $\frac{1}{8}$ inch.....	2.20 extra
x $\frac{1}{8}$ inch x $\frac{3}{16}$ inch.....	2.60 extra
x $\frac{3}{16}$ inch x $\frac{3}{16}$ inch.....	3.20 extra
x $\frac{1}{8}$ inch x less than $\frac{1}{8}$ inch.....	3.60 extra
3 inches on one or both legs by less than $\frac{1}{4}$ inch thick.....	.70 extra

Unequal leg angles are subject to special prices, which will be furnished on application.

For intermediate sizes, the next higher extra to be charged in all cases.

The extra on angles under $1\frac{1}{2}$ inches is governed by the shorter leg, i. e. $1 \times \frac{1}{2} \times \frac{1}{2}$ is \$2.20 extra.

For quantity differentials on mill orders see page 239.

Extras for cutting to specified lengths, see page 239.

STANDARD STEEL CLASSIFICATION—Cont'd.**SMALL TEES.**

$1\frac{1}{2}$ x $1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{1}{4}$ inch and heavier,	\$0.20 extra
$1\frac{1}{2}$ x $1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{3}{16}$ inch. . . . .	.40 extra
$1\frac{1}{2}$ x $1\frac{1}{2}$ inches x $\frac{1}{8}$ inch. . . . .	.50 extra
$1\frac{1}{2}$ x $1\frac{1}{2}$ inches x $\frac{1}{4}$ inch and heavier. . . . .	.40 extra
$1\frac{1}{4}$ x $1\frac{1}{4}$ inches x $\frac{3}{16}$ inch. . . . .	.50 extra
$1\frac{1}{4}$ x $1\frac{1}{4}$ inches x $\frac{1}{8}$ inch. . . . .	.60 extra
1 x 1 to $1\frac{1}{2}$ inches, x $\frac{3}{16}$ inch thick. . . . .	.60 extra
1 x 1 to $1\frac{1}{2}$ x $1\frac{1}{2}$ inches, x $\frac{1}{2}$ inch thick. . . . .	.70 extra
$\frac{7}{8}$ x $\frac{7}{8}$ inch x $\frac{1}{8}$ inch and thicker. . . . .	.90 extra
$\frac{3}{4}$ x $\frac{3}{4}$ inch x $\frac{1}{8}$ inch and thicker.	1.10 extra
$\frac{5}{8}$ x $\frac{5}{8}$ inch x $\frac{1}{8}$ inch and thicker.	2.20 extra

Unequal leg tees are subject to special prices, which will be furnished on application.
For intermediate sizes, the next higher extra to be charged in all cases.

HEXAGONS.

$\frac{3}{4}$ to $2\frac{1}{2}$ inches.	\$0.30 extra
$\frac{5}{8}$ to $\frac{11}{16}$ inch. . . . .	.50 extra
$\frac{1}{2}$ to $\frac{9}{16}$ inch. . . . .	.70 extra
$\frac{7}{16}$ inch.	1.10 extra
$\frac{3}{8}$ inch.	1.30 extra
$\frac{5}{16}$ inch.	1.50 extra

OVALS.

$\frac{3}{4}$ to $1\frac{1}{2}$ inches.	\$0.30 extra
$\frac{5}{8}$ to $\frac{11}{16}$ inch. . . . .	.50 extra
$\frac{9}{16}$ inch. . . . .	.60 extra
$\frac{1}{2}$ inch. . . . .	.80 extra
$\frac{7}{16}$ inch.	1.00 extra
$\frac{3}{8}$ inch.	1.20 extra

For intermediate sizes, the next higher extra to be charged in all cases.

HALF OVALS AND HALF ROUNDS.

$\frac{7}{8}$ to 4 inches x $\frac{7}{16}$ inch and thicker.	\$0.50 extra
$\frac{7}{8}$ to 4 inches x Nos. 7, 8, 9 and $\frac{3}{16}$ inch. . . . .	.70 extra
$\frac{7}{8}$ to 4 inches x Nos. 10, 11, 12 and $\frac{1}{8}$ inch.	1.00 extra
$\frac{3}{4}$ inch to $\frac{11}{16}$ inch x $\frac{3}{16}$ inch and thicker. . . . .	.80 extra
$\frac{3}{4}$ inch to $\frac{11}{16}$ inch x Nos. 10, 11, 12 and $\frac{1}{8}$ inch.	1.20 extra
$\frac{3}{4}$ inch to $\frac{11}{16}$ inch x Nos. 13, 14 and 15.	1.40 extra
$\frac{5}{8}$ inch to $\frac{11}{16}$ inch x $\frac{3}{16}$ inch (No. 9) and thicker.	1.00 extra
$\frac{5}{8}$ inch to $\frac{11}{16}$ inch x Nos. 10, 11, 12 and $\frac{1}{8}$ inch.	1.30 extra
$\frac{5}{8}$ inch to $\frac{11}{16}$ inch x Nos. 13, 14 and 15.	1.50 extra
$\frac{1}{2}$ inch to $\frac{9}{16}$ inch x $\frac{1}{8}$ inch and thicker.	1.30 extra
$\frac{1}{2}$ inch to $\frac{9}{16}$ inch x Nos. 13, 14 and 15.	1.80 extra
$\frac{7}{16}$ inch x $\frac{5}{16}$ inch and thicker.	2.10 extra
$\frac{7}{16}$ inch x Nos. 13, 14 and 15.	2.30 extra
$\frac{3}{8}$ inch x $\frac{3}{16}$ inch and thicker.	2.50 extra
$\frac{3}{8}$ inch x Nos. 14 and 15.	2.70 extra
$\frac{5}{16}$ inch x $\frac{3}{16}$ inch and thicker.	2.60 extra
$\frac{5}{16}$ inch x less than $\frac{3}{16}$ inch thick.	2.80 extra

For intermediate sizes, the next higher extra to be charged in all cases.

For quantity differentials on mill orders see page 239.

Extras for cutting to specified lengths, see page 239.

STANDARD STEEL CLASSIFICATION—Cont'd.

LIGHT BARS AND BANDS.

1½ to 6 inch x Nos. 7, 8, 9 and ⅜ inch.....	\$0.40 extra
1½ to 6 inch x Nos. 10, 11, 12 and ⅝ inch.....	.60 extra
1 to 1⅞ inch x Nos. 7, 8, 9 and ⅞ inch.....	.50 extra
1 to 1⅞ inch x Nos. 10, 11, 12 and ⅝ inch.....	.70 extra
1⅜ to 1⅝ inch x Nos. 7, 8, 9 and ⅞ inch.....	.70 extra
1⅜ to 1⅝ inch x Nos. 10, 11, 12 and ⅝ inch.....	.80 extra
1⅞ to ⅞ inch x Nos. 7, 8, 9 and ⅞ inch.....	1.00 extra
1⅞ to ⅞ inch x Nos. 10, 11, 12 and ⅝ inch.....	1.20 extra
⅞ to ⅝ inch x Nos. 7, 8, 9 and ⅞ inch.....	1.20 extra
⅞ to ⅝ inch x Nos. 10, 11, 12 and ⅝ inch.....	1.30 extra
½ inch x Nos. 7, 8, 9 and ⅞ inch.....	1.30 extra
½ inch x Nos. 10, 11, 12 and ⅝ inch.....	1.50 extra
⅞ inch x Nos. 7, 8, 9 and ⅞ inch.....	1.80 extra
⅞ inch x Nos. 10, 11, 12 and ⅝ inch.....	2.10 extra
⅞ inch x Nos. 7, 8, 9 and ⅞ inch.....	1.90 extra
⅞ inch x Nos. 10, 11, 12 and ⅝ inch.....	2.40 extra

For intermediate sizes, the next higher extra to be charged in all cases.

FLAT BARS AND HEAVY BANDS.

1 to 6 inches x ⅜ to 1 inch.....	Base
1 to 6 inches x ½ to ⅝ inch.....	\$0.20 extra
1⅜ to 1⅝ inch x ⅜ to ⅞ inch.....	.40 extra
1⅜ to 1⅝ inch x ½ to ⅞ inch.....	.50 extra
⅞ to ⅝ inch x ⅜ to ⅞ inch.....	.50 extra
⅞ to ⅝ inch x ½ to ⅞ inch.....	.70 extra
½ inch x ⅜ to ⅞ inch.....	1.00 extra
½ inch x ½ to ⅞ inch.....	1.20 extra
⅞ inch x ⅜ inch.....	1.40 extra
⅞ inch x ½ to ⅞ inch.....	1.60 extra
⅞ inch x ½ to ⅞ inch.....	2.00 extra
1⅜ to 6 inches x 1⅞ to 1⅞ inches.....	.10 extra
1½ to 6 inches x 1½ to 1½ inches.....	.20 extra
1¾ to 6 inches x 1⅝ to 2¼ inches.....	.30 extra
3¼ to 6 inches x 3 to 4 inches.....	.40 extra

For intermediate sizes, the next higher extra to be charged in all cases.

For quantity differentials on mill orders see page 239.

Extras for cutting to specified lengths, see page 239.

STEEL TIRE CLASSIFICATION.

$\frac{7}{8}$ in. x $\frac{1}{8}$ in. and $\frac{5}{32}$ in.	\$0.60
$\frac{3}{4}$ in. x $\frac{1}{4}$ in.	.30
$\frac{3}{4}$ in. x $\frac{3}{16}$ in. and $\frac{7}{32}$ in.	.80
$\frac{3}{4}$ in. x $\frac{1}{8}$ in. and $\frac{5}{32}$ in.	1.00
$\frac{5}{8}$ in. x $\frac{3}{16}$ in.	1.00
$\frac{5}{8}$ in. x $\frac{1}{8}$ in. and $\frac{5}{32}$ in.	1.10
1 in. x $\frac{1}{4}$ in. and heavier	Base
$1\frac{1}{2}$ in. x $\frac{3}{16}$ in. and $\frac{7}{32}$ in.	.20
1 in. to $1\frac{7}{16}$ x $\frac{3}{16}$ in. and $\frac{7}{32}$ in.	.30
1 in. to $1\frac{7}{16}$ x $\frac{1}{8}$ in.	.50
$\frac{7}{8}$ in. x $\frac{1}{4}$ in.	.30
$\frac{7}{8}$ in. x $\frac{3}{16}$ in. and $\frac{7}{32}$ in.	.50

For intermediate sizes, the next higher extra to be charged in all cases.

STONE AND MARBLE SAW BLADES.

Classification on car lots same as on bands of same size, width and thickness.

Extra per 100 lbs. for less than car lots.

$1\frac{1}{2}$ inch to 7 inch, Nos. 7, 8, 9 or $\frac{3}{16}$ inch.	20c
$1\frac{1}{2}$ inch to 7 inch, Nos. 10, 11, 12 or $\frac{1}{8}$ inch.	30c

Regular extras and quantity differentials on mill orders, as per standard bar and band steel classification to apply.

QUANTITY DIFFERENTIALS, BARS, BANDS, TIRES, SAW BLADES, SMALL SHAPES, ON MILL ORDERS.

Quantities less than 2,000 lbs., but not less than 1,000 lbs. of a size.	30c per 100 lbs.
Quantities less than 1,000 lbs. of a size.	70c "

EXTRA FOR CUTTING TO SPECIFIED LENGTHS.

Hot sawing or shearing 24 inch or longer bars.	10c extra
Hot sawing or shearing 12 to 24 inches, inclusive.	20c "
Hot shearing or sawing under 12 inches.	30c "
Machine cutting specified lengths above 24 inches.	20c "
Machine cutting specified lengths 12 to 24 inches, inclusive.	40c "
Machine cutting to specified lengths less than 12 inches according to contract, but not less than 60c on each size.	
Shear cutting or hot sawing to lengths of 5 feet and over.	No charge
Machine straightening and centering.	Extra will be furnished on application
Machine straightening alone for ordinary sizes.	20c extra

Rounds up to 5 in. in diameter over 24 ft. long and larger than 5 in. diameter over 18 ft. long will be charged at an extra price.

STEEL HOOP CLASSIFICATION.

Throughout this list the English or Birmingham Standard Gauge is used.

SOFT STEEL HOOPS.

Width.	Gauge.	Extra
1 $\frac{7}{8}$ to 3	13, 14, 15, 16	\$0.10
1 $\frac{7}{8}$ 2	17, 18, 19	.15
1 $\frac{7}{8}$ 2	20	.20
1 $\frac{7}{8}$ 2	21	.25
1 $\frac{7}{8}$ 2	22	.35
1 $\frac{7}{8}$ 2	13, 14 and 15	.15
1 $\frac{7}{8}$ 12	16, 17, 18	.20
1 $\frac{7}{8}$ 12	19 and 20	.25
1 $\frac{7}{8}$ 12	21	.30
1 $\frac{7}{8}$ 12	22	.40
1 $\frac{7}{8}$ and 1	13, 14 and 15	.20
1 $\frac{7}{8}$ 1	14, 17, 18	.25
1 $\frac{7}{8}$ 1	19 and 20	.30
1 $\frac{7}{8}$ 1	21	.35
1 $\frac{7}{8}$ 1	22	.45
1 $\frac{7}{8}$ 1	23	.55
1 $\frac{7}{8}$ 1	24	.65
1 $\frac{7}{8}$ 1	13, 14 and 15	.30
1 $\frac{7}{8}$ 1	16, 17, 18	.35
1 $\frac{7}{8}$ 1	19 and 20	.40
1 $\frac{7}{8}$ 1	21	.45
1 $\frac{7}{8}$ 1	22	.55
1 $\frac{7}{8}$ 1	23	.65
1 $\frac{7}{8}$ 1	24	.75
1 $\frac{7}{8}$ and 1 $\frac{1}{2}$	13, 14 and 15	.40
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	16, 17, 18	.45
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	19 and 20	.50
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	21	.55
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	22	.60
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	23	.70
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	24	.80
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	13, 14 and 15	.45
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	16, 17, 18	.50
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	19 and 20	.60
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	21	.70
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	22	.80
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	23	.90
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	24	1.00
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	13, 14 and 15	.50
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	16, 17, 18	.55
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	19 and 20	.65
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	21	.75
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	22	.85
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	23	.95
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	24	1.05
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	13, 14 and 15	.55
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	16, 17, 18	.60
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	19 and 20	.70
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	21	.80
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	22	.90
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	23	1.00
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	24	1.10
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	13, 14 and 15	.90
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	16, 17, 18	1.00
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	19 and 20	1.10
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	21	1.20
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	13, 14 and 15	1.10
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	16, 17, 18	1.20
1 $\frac{7}{8}$ 1 $\frac{1}{2}$	19 and 20	1.30

EXTRA WIDE HOOPS AND BANDS.

	Extra
2 $\frac{1}{8}$ " to 3" by No. 17	\$0.20
18	.25
19	.30
20	.35
3 $\frac{1}{8}$ " to 4"	
13	.10
14	.15
15	.20
16	.25
17	.35
18	.50
4 $\frac{1}{8}$ " to 5"	
13	.15
14	.20
15	.30
16	.40
5 $\frac{1}{8}$ " to 7"	
13	.20
14	.25
5 $\frac{1}{8}$ " to 6"	
15	.35
16	.45
7 $\frac{1}{8}$ " to 8"	
9 to 1 $\frac{1}{8}$	.15
10, 11 and 12	.20
13	.25
14	.35

ADDITIONAL EXTRAS.

For cutting to specified lengths not less than 24 inches, 5c. per 100 lbs.

For cutting to specified lengths 12 inches to 24 inches, 20c. per 100 lbs.

Extra for cutting to specified lengths less than 12 inches will be furnished on application.

For rounding one end of cut hoop, 5c. per 100 lbs.

For rounding both ends of cut hoop, 10c. per 100 lbs.

For each gauge lighter than included on list, 10c. per 100 lbs.

For intermediate gauges, the extra for the next lighter gauge will be charged.

Extras for flaring, galvanizing and pickling will be quoted on application.

Extras for packing in barrels, casks and boxes will be quoted on application.

EXEMPTION.

Extras for cutting and rounding one end will be waived on all widths when ordered in car load lots for cooerage purposes.

Standard Widths and Gauges for Barrel Hoops when a specified weight per set is required.

SET OF SIX HOOPS.

	7 lbs.	8 lbs.	9 lbs.	10 lbs.	11 lbs.	12 lbs.
No.	No.	No.	No.	No.	No.	No.
Head...	1 $\frac{1}{8}$ 20	1 $\frac{3}{8}$ 19	1 $\frac{1}{2}$ 18	1 $\frac{3}{4}$ 17	1 $\frac{1}{2}$ 16	1 $\frac{1}{4}$ 17
Quar...	1 $\frac{1}{8}$ 21	1 $\frac{3}{8}$ 20	1 $\frac{1}{2}$ 19	1 $\frac{3}{4}$ 18	1 $\frac{1}{2}$ 17	1 $\frac{1}{4}$ 17
Bilge...	1 $\frac{1}{8}$ 21	1 $\frac{3}{8}$ 20	1 $\frac{1}{2}$ 19	1 $\frac{3}{4}$ 18	1 $\frac{1}{2}$ 17	1 $\frac{1}{4}$ 16

SET OF EIGHT HOOPS.

9 $\frac{1}{2}$ lbs. same gau. as	7 lbs., per set	6 hoops.
11	8	6
12 $\frac{1}{2}$	9	6
13	10	6

QUANTITY DIFFERENTIALS ON MILL ORDERS.

Quantities less than 2,000 lbs., but
not less than 1,000 lbs. 15c per 100 lbs.
Quantities less than 1,000 lbs. 35c per 100 lbs.

SPRING STEEL CLASSIFICATION.

SPRING STEEL. OPEN HEARTH SPRING. ROUND AND SQUARE.

$\frac{5}{8}$ to $1\frac{1}{2}$ inch	Base
$\frac{1}{2}$ to $\frac{9}{16}$ inch	extra, 0.2
$\frac{3}{8}$ to $\frac{7}{16}$ inch	" 0.5
$\frac{5}{16}$ inch	" 1.0
$\frac{1}{4}$ inch	" 1.5
$\frac{3}{16}$ inch	" 3.0

FLAT.

$1\frac{1}{4}$ to 6 inch x No. 4 gauge to $\frac{1}{2}$ inch inc.	Base
1 and $1\frac{1}{8}$ inch x No. 1 gauge to 4 gauge inc.	extra, 0.2
1 to 3 inch x No. 5 gauge to 7 gauge inc.	" 0.5
$\frac{3}{4}$ and $1\frac{1}{8}$ inch x No. 1 gauge to 7 gauge inc.	" 0.5
$\frac{3}{8}$ to $1\frac{1}{8}$ inch x No. 1 gauge to 7 gauge inc.	" 1.0
$\frac{3}{4}$ to 3 inch x No. 8 gauge to 10 gauge inc.	" 1.0
$\frac{3}{4}$ to 3 inch x No. 11 gauge to 16 gauge inc.	" 1.5
$\frac{3}{4}$ to 3 inch x No. 17 gauge to 19 gauge inc.	" 2.2
$\frac{3}{8}$ to $\frac{5}{8}$ inch x No. 10 gauge to 16 gauge inc.	" 4.0
$\frac{3}{8}$ to $\frac{5}{8}$ inch x No. 17 gauge to 19 gauge inc.	" 5.0

Cutting to multiples or specified lengths, 24 inch and longer, 1-10c. per lb. extra. Shorter than 24 inch, according to agreement.

CRUCIBLE SPRING STEEL.

Subject to the same extras as on the Open Hearth Spring Steel. The same extra for cutting also applies. Cutting to multiples or specified lengths 24 inch and longer, 20c per pound extra; shorter than 24 inch, special price.

On direct orders from mill, the following quantity differentials apply:

Quantities less than 2,000 lbs., but not less than 1,000 lbs. of a size	\$0.15 per 100 lbs.
Quantities less 1,000 lbs. of a size .....	.35 per 100 lbs.

STANDARD TOOL STEEL CLASSIFICATION. ROUND, SQUARE AND OCTAGON.

$\frac{5}{8}$ to 2 in..... Base			Extra per lb.			
			Extra per lb.			
$2\frac{1}{8}$	to 3 in.....	1	cent	$\frac{9}{16}$	to $\frac{1}{2}$ in.....	$\frac{5}{10}$ cent
$3\frac{1}{8}$	4	$1\frac{5}{10}$		$\frac{7}{8}$	$\frac{3}{8}$	1
$4\frac{1}{8}$	5	2		$\frac{5}{8}$	and $\frac{11}{16}$ in.....	2
$5\frac{1}{8}$	6	$2\frac{5}{10}$		$\frac{1}{4}$	$\frac{9}{16}$	3
$6\frac{1}{8}$	7	3		$\frac{3}{8}$	in.....	5
$7\frac{1}{8}$	8	$3\frac{5}{10}$		$\frac{5}{16}$	.....	10
				$\frac{1}{8}$	.....	18

FLAT.

$\frac{5}{8}$ to 2 in. wide x $\frac{9}{16}$ to 2 in. thick. Base			Extra per lb.		
			Extra per lb.		
$\frac{1}{8}$ x $\frac{8}{16}$ in.	20	cents	$\frac{5}{8}$ x $\frac{3}{8}$ to $\frac{5}{8}$ in.	$1\frac{5}{10}$	cents
$\frac{1}{8}$ x $\frac{1}{4}$	15		$\frac{5}{8}$ x $\frac{11}{16}$ 8	1	
$\frac{1}{8}$ x $\frac{5}{16}$	8		$\frac{3}{8}$ x $\frac{7}{8}$ 8	1	
$\frac{1}{8}$ x $\frac{3}{8}$	4		$\frac{7}{8}$ x $\frac{1}{2}$ 8	1	
$\frac{1}{8}$ x $\frac{7}{16}$ to $\frac{1}{2}$ in.	3		$\frac{1}{2}$ x $\frac{9}{16}$ 8	1	
$\frac{1}{8}$ x $\frac{9}{16}$ 7	2		$\frac{9}{16}$ x $2\frac{1}{8}$ 8	1	
$\frac{1}{8}$ x $7\frac{1}{8}$ 8	3		$\frac{3}{8}$ to 2 x $2\frac{1}{8}$ to 7 in. 1		
$\frac{3}{16}$ x $\frac{1}{4}$ in.	5		$\frac{5}{8}$ $1\frac{3}{4}$ x $7\frac{1}{8}$ 8	1	
$\frac{3}{16}$ x $\frac{5}{16}$	4		$1\frac{1}{8}$ 2 x $7\frac{1}{8}$ 8	$1\frac{5}{10}$	
$\frac{3}{16}$ x $\frac{3}{8}$	3		$2\frac{1}{8}$ 3 x $2\frac{1}{8}$ 5	1	
$\frac{3}{16}$ x $\frac{7}{16}$ to $\frac{5}{8}$ in.	2		$2\frac{1}{8}$ 3 x $5\frac{1}{8}$ 8	$1\frac{5}{10}$	
$\frac{3}{16}$ x $\frac{11}{16}$ 2	$1\frac{5}{10}$		$3\frac{1}{8}$ 4 x $3\frac{1}{8}$ 6	$1\frac{5}{10}$	
$\frac{3}{16}$ x $2\frac{1}{8}$ 7	1		$3\frac{1}{8}$ 4 x $6\frac{1}{8}$ 8	2	
$\frac{3}{16}$ x $7\frac{1}{8}$ 8	2		$4\frac{1}{8}$ 5 x $4\frac{1}{8}$ 7	2	
$\frac{1}{4}$ x $\frac{5}{16}$ $\frac{3}{8}$	2		$4\frac{1}{8}$ 5 x $7\frac{1}{8}$ 8	$2\frac{5}{10}$	
$\frac{1}{4}$ x $\frac{7}{8}$ $\frac{5}{8}$	$1\frac{5}{10}$		$5\frac{1}{8}$ 6 x $5\frac{1}{8}$ 8	$2\frac{5}{10}$	
$\frac{1}{4}$ x $\frac{11}{16}$ 2	$1\frac{5}{10}$		$6\frac{1}{8}$ 7 x $6\frac{1}{8}$ 7	3	
$\frac{1}{4}$ x $2\frac{1}{8}$ 7	1		$6\frac{1}{8}$ 8 x $7\frac{1}{8}$ 8	$3\frac{5}{10}$	
$\frac{1}{4}$ x $7\frac{1}{8}$ 8	2				

CUTTING TO SPECIFIED SINGLE AND MULTIPLE LENGTHS.

			Extra per lb.		
24 inches or over			$\frac{1}{2}$	cent	
18	to 24 inches.	1			
12	18	$1\frac{1}{2}$			
6	12	2			
Less than 6 inches, special price.					

NATIONAL IRON CLASSIFICATION.

Adopted January 3, 1896.

ROUNDS AND SQUARES.

1 to 17 $\frac{1}{8}$ inch.	Base
$\frac{1}{8}$ to $\frac{3}{8}$	\$2.50 extra
$\frac{3}{8}$ to $\frac{1}{2}$	1.40
$\frac{1}{2}$ to $\frac{5}{8}$ .....	.90
$\frac{5}{8}$ to $\frac{3}{4}$ .....	.70
$\frac{3}{4}$ to $\frac{7}{8}$ .....	.50
$\frac{7}{8}$ to 1 .....	.40
1 to $1\frac{1}{8}$ .....	.30
$1\frac{1}{8}$ to $1\frac{1}{4}$ .....	.20
$1\frac{1}{4}$ to $1\frac{3}{8}$ .....	.10
$1\frac{3}{8}$ to $1\frac{1}{2}$ .....	.20
$1\frac{1}{2}$ to $1\frac{5}{8}$ .....	.50
$1\frac{5}{8}$ to $1\frac{3}{4}$ .....	.80
$1\frac{3}{4}$ to 2	1.00
2 to $2\frac{1}{8}$	1.30
$2\frac{1}{8}$ to $2\frac{1}{4}$	1.80
$2\frac{1}{4}$ to $2\frac{3}{8}$	2.20
$2\frac{3}{8}$ to $2\frac{1}{2}$	2.50

LIGHT BANDS.

7 to 8	x No. 9 to $\frac{3}{16}$	\$0.90 extra
7 to 8	x 10, 11 and 12 ..	1.00
6 to 6	x 9 to $\frac{3}{16}$ .....	.70
6 to 6	x 10, 11 and 12 ..	.80
4 to 4	x 9 to $\frac{3}{16}$ .....	.50
4 to 4	x 10, 11 and 12 ..	.60
1 to 1	x 9 to $\frac{3}{16}$ .....	.40
1 to 1	x 10, 11 and 12 ..	.50
1 to 1	x 9 to $\frac{3}{16}$ .....	.50
1 to 1	x 10, 11 and 12 ..	.60
1 to 1	x 9 to $\frac{3}{16}$ .....	.60
1 to 1	x 10, 11 and 12 ..	.70
1 to 1	x 9 to $\frac{3}{16}$ .....	.80
1 to 1	x 10, 11 and 12 ..	.90
1 to 1	x 9 to $\frac{3}{16}$	1.00
1 to 1	x 10, 11 and 12 ..	1.10
1 to 1	x 9 to $\frac{3}{16}$	1.30
1 to 1	x 10, 11 and 12 ..	1.40
x No. 9 to $\frac{3}{16}$		1.50
x No. 10, 11 and 12		1.60

BEVEL EDGE BOX IRON.

Same as light bands, same sizes.

BEVEL EDGE SHAFT IRON. $\frac{1}{8}$ higher than same size heavy bands.**BEADED BAND IRON.** $\frac{1}{4}$ to 2 inches \$0.70 extra**SAND BAND IRON.** $\frac{1}{8}$ ct. above same sizes light bands.**HORSE SHOE IRON.**

All sizes 1 cent extra

FLAT BARS.

$\frac{1}{4}$ to 4 in. by $\frac{3}{8}$ to 1 in.	Base
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in.	\$0.10 extra
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.20
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.40
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.50
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.90
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.30
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.50
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.60
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.10
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.40
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.60
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.80
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.60
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.80
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in.	1.00
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.80
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in. ....	.90
$\frac{1}{4}$ to $\frac{1}{2}$ in. by $\frac{3}{8}$ to 1 in.	1.00

HEAVY BANDS.

$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in.	\$1.50 extra
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in.	1.00
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in. ....	.80
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in. ....	.50
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in. ....	.30
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in. ....	.20
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in. ....	.30
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in. ....	.50
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in. ....	.70
$\frac{3}{8}$ to $\frac{7}{8}$ in. by $\frac{1}{4}$ to $\frac{3}{4}$ in. ....	.70

Heavy bands $\frac{7}{8}$ in. thick $\frac{1}{8}$ ct. per lb. higher than $\frac{3}{4}$ to $\frac{7}{8}$ in. thick.**OVALS.**

$\frac{1}{4}$ to $\frac{1}{2}$ inch	\$.80 extra
$\frac{1}{4}$ to $\frac{1}{2}$ inch .....	.60
$\frac{1}{4}$ to $\frac{1}{2}$ inch .....	.50
$\frac{1}{4}$ to $\frac{1}{2}$ inch .....	.40
$\frac{1}{4}$ to $\frac{1}{2}$ inch	1.10
$\frac{1}{4}$ to $\frac{1}{2}$ inch	1.00
$\frac{1}{4}$ to $\frac{1}{2}$ inch	1.20

HALF-OVAL AND HALF-ROUND.

$\frac{1}{4}$ inch	\$4.50 extra
$\frac{1}{4}$ to $\frac{1}{2}$ inch	3.50
$\frac{1}{4}$ to $\frac{1}{2}$ inch	2.50
$\frac{1}{4}$ to $\frac{1}{2}$ inch	1.20
$\frac{1}{4}$ to $\frac{1}{2}$ inch .....	.90
$\frac{1}{4}$ to $\frac{1}{2}$ inch .....	.70
$\frac{1}{4}$ to $\frac{1}{2}$ inch .....	.50
$\frac{1}{4}$ to $\frac{1}{2}$ inch .....	.60

Half-Oval less than $\frac{1}{4}$ the width in thickness, extra price.Extra for cutting to length, $\frac{1}{8}$ ct.

NORWAY AND SWEDISH IRON CLASSIFICATION.

ROUNDS AND SQUARES.

1	to $1\frac{1}{8}$ in.	Base.
2	$2\frac{5}{8}$	$\frac{1}{10}$ extra
$2\frac{3}{4}$	$3\frac{1}{4}$	$\frac{2}{10}$
$3\frac{1}{2}$	4	$\frac{5}{10}$
$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{10}$
$\frac{9}{16}$	$\frac{5}{8}$	$\frac{2}{10}$
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{10}$
$\frac{3}{8}$	in.	$\frac{4}{10}$
$\frac{5}{16}$		$\frac{6}{10}$
$\frac{1}{4}$		1c
$\frac{3}{16}$		$1\frac{1}{2}$ c

FLATS.

$1\frac{1}{2}$ to 4	by $\frac{3}{8}$ to 1	in. thick.	Base.
$4\frac{1}{4}$	6	$\frac{3}{8}$ 1	$\frac{1}{10}$ extra
$1\frac{3}{4}$	6	$1\frac{1}{8}$ $1\frac{1}{2}$	$\frac{2}{10}$
$2\frac{1}{2}$	6	2	$\frac{5}{10}$
$1\frac{1}{4}$	and $1\frac{3}{8}$	by $\frac{3}{8}$ to 1	$\frac{1}{10}$
1	$1\frac{1}{8}$	$\frac{3}{8}$ $\frac{7}{8}$	$\frac{2}{10}$
$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$	and $\frac{7}{8}$	by $\frac{3}{8}$ to $\frac{5}{8}$ in. thick.	$\frac{4}{10}$
$1\frac{1}{2}$ to 6	by $\frac{1}{4}$ and $\frac{5}{16}$		$\frac{1}{10}$
1	$1\frac{3}{8}$	$\frac{1}{4}$ $\frac{5}{16}$	$\frac{3}{10}$
$\frac{3}{4}$ and $\frac{7}{8}$	$\frac{1}{4}$ $\frac{5}{16}$		$\frac{5}{10}$
$\frac{1}{2}$	$\frac{5}{8}$ $\frac{1}{4}$ $\frac{5}{16}$		1c
1	to 2	$\frac{3}{16}$	$\frac{5}{10}$
$\frac{3}{4}$ and $\frac{7}{8}$	$\frac{3}{16}$		$\frac{8}{10}$
$\frac{1}{2}$	$\frac{5}{8}$ $\frac{3}{16}$		$1\frac{2}{10}$

NAIL RODS.

$\frac{3}{8}$ by $\frac{3}{16}$, 25-lb. and 50-lb. bundles	$1\frac{1}{2}$ extra
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MILL EXTRAS APPLYING TO GALVANIZED SHEETS. (Flat.)

WIDTHS.

	Price		Price
No. 10-15 over 32 to 40 in. No extra		No. 22-24 over 32 to 36 in.	\$0.40
" 40 to 44 in.	\$0.20	" 36 to 40 in.	1.00
" 44 to 48 in.	.40	" 40 to 44 in.	1.60
No. 16-18 over 32 to 36 in. No extra		No. 25-26 over 32 to 36 in.	.40
" 36 to 40 in.	\$0.40	" 36 to 40 in.	1.20
" 40 to 44 in.	.60	No. 27 over 32 to 36 in.	.40
" 44 to 48 in.	1.20	No. 28 over 32 to 36 in.	.40
No. 19-21 over 32 to 36 in.	\$0.40	No. 29-30 over 32 to 36 in.	.40
" 36 to 40 in.	.80	No. 18 and heavier, under 24 to 15 in. ....	.20
" 40 to 44 in.	1.20	No. 19 and lighter, under 24 to 15 in. ....	.50
" 44 to 48 in.	2.40		

LENGTHS.

	Price		Price
No. 10-30 under 60 to 40 in.	\$0.20	No. 10-30 under 30 to 24 in.	\$0.80
" 40 to 30 in.	.50	over 120 to 144 in.	.40

MILL EXTRAS ON BLACK SHEETS FOR EXTRA WIDTHS AND LENGTHS.

WIDTHS.	Extra per 100 lbs.		Extra per 100 lbs.
*No. 12 to 16, 15 to 48 in. wide, no extra		No. 27, over 32 to 36 in. wide	\$0.20
Over 48 in. wide	\$0.25	Over 36 to 40 in. wide	.80
No. 16 and heavier, under 15 to 12 in. wide	.10	" 40 to 44 "	1.00
Under 12 to 9 in. wide	.20	No. 28, over 32 to 36 in. wide	.20
" 9 to 6 "	.30	Over 36 to 40 in. wide	.80
No. 17 and 18, 20 to 36 in. wide, no extra		No. 29 to 30, over 32 to 36 in. wide	.40
Over 36 to 48 in. wide	.25		
Under 20 to 12 "	.10		
" 12 to 9 "	.20		
" 9 to 6 "	.30		
No. 19 and lighter, under 24 to 12 in. wide	.20		
Under 12 to 9 in. wide	.40		
" 9 to 6 "	.50		
No. 19 to 21, over 32 to 36 in. wide	.20		
Over 36 to 40 in. wide	.30		
" 40 to 44 "	.40		
" 44 to 48 "	.60		
No. 22 to 24, over 32 to 36 in. wide	.20		
Over 36 to 40 in. wide	.40		
" 40 to 44 "	.80		
" 40 to 48 "	1.00		
No. 25 to 26, over 32 to 36 in. wide	.20		
Over 36 to 40 in. wide	.60		
" 40 to 44 "	.80		

LENGTHS.

No. 12-13 and heavier, 40 in. and longer	no extra
No. 14 to 16, 40 to 144 in. long	"
Over 144 in. long	.10
No. 16 and heavier, under 40 to 30 in. long	.10
Under 30 to 24 in. long	.20
" 24 to 18 "	.30
No. 17 to 18, 48 to 132 in. long, no extra	
Over 132 in. long	.20
Under 48 to 40 in. long	.10
" 40 to 24 "	.20
" 24 to 18 "	.30
No. 19 and lighter, 60 to 120 in. long	no extra
Over 120 to 144 in. long	.20
Under 60 to 30 "	.20
" 30 to 18 "	.40

Odd size sheets in less than 4,000 lbs. to the size will be subject to 10c per 100 lbs. extra. Each quality of black or galvanized sheets ordered in less than 25 bundles, 10c per 100 lbs. extra.

*No. 10. 72 inches wide, 75c extra.

NAIL CARD.**ADVANCES ON STANDARD WIRE NAILS, IN KEGS.**

Originally adopted and effective December 1, 1896.

**COMMON, FENCE,
SHINGLE, TOBACCO,
FLOORING and COMMON
BRADS.**

	ADVANCES.
20d to 60d.....	Base
10d to 16d.....	\$0.05
8d and 9d.....	.10
6d and 7d.....	.20
4d and 5d.....	.30
3d.....	.45
2d.....	.70

**BARBED COMMON and
BARBED CAR NAILS.**

15 cents advance over common.

**CASING, SIDING and
SMOOTH BOX NAILS.**

10d and larger.....	\$0.15
8d and 9d.....	.25
6d and 7d.....	.35
4d and 5d.....	.50
3d.....	.70
2d.....	1.00

Barbed Box, 15 cents advance over smooth nails.

**SMOOTH FINISHING
NAILS.**

10d and larger.....	\$0.25
8d and 9d.....	.35
6d and 7d.....	.45
4d and 5d.....	.65
3d.....	.85
2d.....	1.15

LINING NAILS.

$\frac{3}{4}$ -inch.....	\$1.20
$\frac{1}{2}$ -inch.....	1.00
1 -inch.....	.80

SLATING NAILS.

2d.....	\$0.80
3d.....	.60
4d.....	.40
5d.....	.40
6d.....	.30

FINE NAILS.

2d.....	\$1.00
3d, $1\frac{1}{2}$ x15.....	.50
3d, extra fine, $1\frac{1}{2}$ x16.....	.65
4d.....	.50

BARREL NAILS.

	ADVANCES.
$\frac{3}{4}$ -inch.....	\$1.00
$\frac{1}{2}$ -inch.....	.85
1 -inch.....	.70
$1\frac{1}{8}$ -inch.....	.60
$1\frac{1}{4}$ -inch.....	.50
$1\frac{3}{8}$ -inch.....	.40
$1\frac{1}{2}$ -inch.....	.30

BARBED ROOFING NAILS.

$\frac{3}{4}$ -inch.....	\$0.75
$\frac{1}{2}$ -inch.....	.65
1 -inch.....	.60
$1\frac{1}{8}$ -inch.....	.60
$1\frac{1}{4}$ -inch.....	.55
$1\frac{3}{8}$ -inch.....	.55
$1\frac{1}{2}$ and $1\frac{3}{4}$ -inch.....	.45
2 -inch.....	.35

**CLINCH NAILS.
(Annealed or Bright)**

2d.....	\$1.05
3d.....	.85
4d and 5d.....	.65
6d and 7d.....	.55
8d and 9d.....	.45
10d to 20d.....	.35

**HINGE NAILS.
(Annealed or Bright)**

4d.....	\$0.80
6d.....	.70
8d.....	.60
10d and larger.....	.50

BOAT NAILS.

25 cents extra over hinge.

SPIKES.

All sizes to 9-inch.....	\$0.10
10-inch and larger.....	.25

Special Gauges 10c additional.

BARBED DOWEL PINS.

$\frac{5}{8}$ -inch.....	\$1.25
$\frac{3}{4}$ -inch.....	1.00
$\frac{7}{8}$ -inch.....	.85
1 -inch.....	.70
$1\frac{1}{8}$ -inch.....	.60
$1\frac{1}{4}$ -inch.....	.60
$1\frac{3}{8}$ -inch.....	.60
$1\frac{1}{2}$ -inch.....	.60

STRUCTURAL PLATES AND BARS.**VARIATION IN SHEARING.**

Beams and Channels, $\frac{3}{4}$ " either way.

Angles, Z and other Shapes, nothing under and $\frac{3}{4}$ " over.

Universal Plates, length, nothing under and $\frac{3}{4}$ " over.

Sheared Plates, length, $\frac{1}{4}$ " under and $\frac{1}{2}$ " over.

width, $\frac{1}{4}$ " either way.

Rounds and Squares, up to 2", $\frac{1}{4}$ " either way.

Rounds and Squares, 2" to 3" inclusive, $\frac{3}{8}$ " either way.

Rounds and Squares, over 3" to 4 $\frac{1}{4}$ " inclusive, up to and including 20' long, $\frac{3}{4}$ " either way.

Rounds and Squares, over 3" to 4 $\frac{1}{4}$ " inclusive, over 20' long, 1" under and $\frac{3}{4}$ " over.

Rounds over 4 $\frac{1}{4}$ " to 7 $\frac{1}{4}$ " inclusive, up to and including 20' long, $\frac{3}{4}$ " either way.

Rounds over 4 $\frac{1}{4}$ " to 7 $\frac{1}{4}$ " inclusive, over 20' long, 1 $\frac{1}{4}$ " under and $\frac{3}{4}$ " over.

Flats, 1" to 3" wide inclusive, $\frac{1}{4}$ " either way.

Flats over 3" to 6" wide, up to and including 20' long, $\frac{3}{4}$ " under and $\frac{3}{8}$ " over.

Flats over 3" to 6" wide, over 20' long, 1 $\frac{1}{4}$ " under and $\frac{3}{8}$ " over.

Shapes up to but not including 3", $\frac{1}{4}$ " either way.

EXTRAS FOR ROLLING**EXTRA WIDTHS OF PLATES.**

Adopted by the Steel Plate Manufacturers, January 7, 1902.

Base price covers plates 100" wide and under by $\frac{1}{4}$ " thick and thicker, of Tank, Ship or Bridge quality, thickness being determined by gauge on the edge of the plates. Percentages as to overweight on plates, whether ordered by gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges lighter than $\frac{1}{4}$ " to and including

$\frac{3}{8}$ " plates, on thin edges..... 10 per 100 lbs. extra

Gauges No. 7 and No. 8..... 15

Gauge No. 9..... 25

Plates over 100" to 110".....not less than .05

Plates over 110" to 115"..... .10

Plates over 115" to 120"..... .15

Plates over 120" to 125"..... .25

Plates over 125" to 130"..... .50

Plates over 130"..... 1.00

All sketches..... .10

Wasteful or expensive sketches subject to special arrangement.

Complete Circles, 3' dia. and over..... 20

Boiler and Flange Steel Plates..... 10

A. B. M. A., and Ord'y Firebox Steel Plates..... 20

Hartford F. B..... 50

Still Bottom Steel..... 30

Marine Steel Plates..... 40

Cutting to lengths or dia. under 3' to 2' incl.. 25

Cutting to lengths or dia. under 2' to 1' incl.. 50

Cutting to lengths or dia. under 1' 1.55

Locomotive Firebox Steel.....Special

Shell grade of steel is abandoned.

All prices to be made delivered f. o. b. cars or dock.

STANDARD SPECIFICATIONS
FOR
SPECIAL OPEN-HEARTH PLATE,
STRUCTURAL, PIN AND RIVET STEEL,
AND
STRUCTURAL CAST IRON.

Adopted by the Ass'n Am. Steel Manufacturers June 29, 1901.

SPECIAL OPEN-HEARTH PLATE STEEL.

Steel shall be of four grades—EXTRA SOFT, FIRE BOX, FLANGE OR BOILER, and BOILER RIVET STEEL.

EXTRA SOFT STEEL.

Ultimate strength, 45,000 to 55,000 pounds per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 28 per cent. Cold and Quench bends, 180 degrees flat on itself, without fracture on outside of bent portion. Maximum Phosphorus, .04 per cent.; Maximum Sulphur, .04, per cent.

FIRE BOX STEEL.

Ultimate strength, 52,000 to 62,000 pounds per square inch. Elastic limit not less than one-half the ultimate strength. Elongation, 26 per cent. Cold and Quench bends, 180 degrees flat on itself, without fracture on outside of bent portion.

FLANGE OR BOILER STEEL.

Ultimate strength, 55,000 to 65,000 pounds per square inch. Elastic limit not less than one-half the ultimate strength. Elongation, 25 per cent. Cold and Quench bends, 180 degrees flat on itself, without fracture on outside of bent portion. Maximum Phosphorus, .04 per cent.; Maximum Sulphur, .05 per cent.

BOILER RIVET STEEL.

Steel for boiler rivets shall be made the same as Extra Soft Steel, specified above.

TEST PIECES.

All tests and inspections shall be made at place of manufacture prior to shipment.

The tensile strength, limit of elasticity and ductility shall be determined from a standard test piece cut from the finished material. The standard shape of the test piece for sheared plates shall be as shown on page 249. On tests cut from other material the test piece may be either the same as for plates, or it may be planed or turned parallel throughout its entire length. The elongation shall be measured on an original length of eight inches, except when the thickness of the finished material is $\frac{5}{16}$ inch or less, in which case the elongation shall be measured in a length equal to sixteen times the thickness; and except in rounds of $\frac{3}{4}$ inch or less in diameter, in which case the elongation shall be measured in a length equal to eight times the diameter of section tested. Four test pieces shall be taken from each melt of finished material; two for tension and two for bending.

Material which is to be used without annealing or further treatment is to be tested in the condition in which it comes from the rolls. When material is to be annealed or otherwise treated before use, the specimen representing such material is to be similarly treated before testing.

Every finished piece of steel shall be stamped with the melt number. Rivet steel may be shipped in bundles securely wired together, with the melt number on a metal tag attached.

All plates shall be free from surface defects and have a workmanlike finish.

VARIATION WHEN ORDERED TO GAUGE.

For all plates ordered to gauge, there will be permitted an average excess of weight over that corresponding to the dimensions on the order equal in amount to that specified in the table shown on page 250, provided no plate shall be rejected for light gauge measuring .01" or less below the ordered thickness.

VARIATION WHEN ORDERED TO WEIGHT.

See table on page 250.

STRUCTURAL STEEL.

Steel may be made by either the Open-Hearth or Bessemer process, and shall be of three grades, **RIVET, SOFT and MEDIUM.**

RIVET STEEL.

Ultimate strength, 50,000 to 60,000 pounds per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 26 per cent. Bending test, 180 degrees flat on itself, without fracture on outside of bent portion.

SOFT STEEL.

Ultimate strength, 52,000 to 62,000 pounds per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 25 per cent. Bending test, 180 degrees flat on itself, without fracture on outside of bent portion.

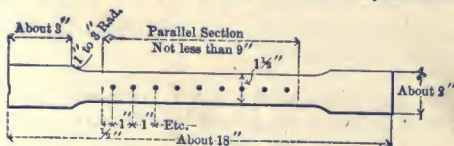
MEDIUM STEEL.

Ultimate strength, 60,000 to 70,000 pounds per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 22 per cent. Bending test, 180 degrees to a diameter equal to thickness of piece tested, without fracture on outside of bent portion.

TEST PIECES.

All tests and inspections shall be made at place of manufacture prior to shipment.

The tensile strength, limit of elasticity and ductility shall be determined from a standard test piece cut from the finished material. The standard shape of the test piece for sheared plates shall be as shown by the following sketch:



Pieces to be of same thickness as the plate.

On tests cut from other material the test piece may be either the same as for plates, or it may be planed or turned parallel throughout its entire length. The elongation shall be measured on an original length of 8 inches, except when the thickness of the finished material is $\frac{1}{8}$ inch or less, in which case the elongation shall be measured in a length equal to sixteen times the thickness; and except in rounds of $\frac{1}{8}$ inch or less in diameter, in which case the elongation shall be measured in a length equal to eight times the diameter of section tested. Two test pieces shall be taken from each melt or blow of finished material, one for tension and one for bending.

Material which is to be used without annealing or further treatment is to be tested in the condition in which it comes from the rolls. When material is to be annealed or otherwise treated before use, the specimen representing such material is to be similarly treated before testing.

Every finished piece of steel shall be stamped with the blow or melt number, and steel for pins shall have the blow or melt number stamped on the ends. Rivet and lacing steel, and small pieces for pin plates and stiffeners, may be shipped in bundles securely wired together, with the blow or melt number on a metal tag attached.

Finished bars must be free from injurious seams, flaws or cracks, and have a workmanlike finish.

ALLOWANCES FOR OVERWEIGHT

FOR

SHEARED PLATES.

Adopted by the Ass'n Am. Steel Manufacturers Aug. 9, 1895. Revised July 17, 1896, October 23, 1896, and February 15, 1901.

The variation in cross-section or weight of more than $2\frac{1}{2}$ per cent. from that specified will be sufficient cause for rejection, except in the case of Sheared Plates, which will be covered by the following permissible variations:

WHEN ORDERED TO WEIGHT.

Plates $12\frac{1}{2}$ pounds per square foot or heavier, up to 100 inches wide, when ordered to weight, shall not average more than $2\frac{1}{2}$ per cent. variation above or $2\frac{1}{2}$ per cent. below the theoretical weight. When 100 inches wide and over, 5 per cent. above or 5 per cent. below the theoretical weight.

Plates under $12\frac{1}{2}$ pounds per square foot, when ordered to weight, shall not average a greater variation than the following:

Up to 75 inches wide, $2\frac{1}{2}$ per cent. above or $2\frac{1}{2}$ per cent. below the theoretical weight. 75 inches wide up to 100 inches wide, 5 per cent. above or 3 per cent. below the theoretical weight. When 100 inches wide and over 10 per cent. above or 3 per cent. below the theoretical weight.

WHEN ORDERED TO GAUGE.

For all plates ordered to gauge there will be permitted an average excess of weight over that corresponding to the dimensions on the order equal in amount to that specified in the following table.

Plates will be considered up to gauge if measuring not over $\frac{1}{16}$ inch less than the ordered gauge.

**TABLE OF ALLOWANCES FOR OVERWEIGHT FOR
RECTANGULAR PLATES WHEN ORDERED
TO GAUGE.**

Thickness of Plate.	Width of Plate.				
	Up to 50 in.	50 in. and above.	Up to 75 in.	75 in. to 100 in.	Over 100 in.
$\frac{1}{8}$ up to $\frac{5}{8}$ in.	10 per ct.	15 per ct.	.....	.....	.....
$\frac{3}{8}$	$8\frac{1}{2}$	$12\frac{1}{2}$	.....	.....	.....
$\frac{7}{8}$	7	10	.....	.....	.....
$\frac{1}{4}$ inch.	.....	.....	10 per ct.	14 per ct.	18 per ct.
$\frac{1}{2}$	.....	.....	8	12	16
$\frac{3}{4}$	.....	.....	7	10	13
$\frac{7}{8}$	.....	.....	6	8	10
$\frac{1}{2}$	.....	.....	5	7	9
$\frac{3}{4}$	.....	.....	$4\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$
$\frac{7}{8}$	.....	.....	4	6	8
over $\frac{1}{8}$	.....	.....	$3\frac{1}{2}$	5	$6\frac{1}{2}$

SIZES OF PLATES AND HEADS WE CAN FURNISH.

Thick. Plate	120 WIDE	115 WIDE	110 WIDE	100 WIDE	90 WIDE	80 WIDE	72 WIDE	60 WIDE	50 WIDE	40 WIDE	30 WIDE	Dia. Heads
3-16	....	....	....	....	....	....	240	250	280	360	360	75
1-4	....	....	156	200	200	....	240	320	330	420	420	115
5-16	144	156	200	250	250	420	420	480	480	480	480	120
3-8	180	200	220	300	360	500	600	600	600	600	600	126
7-16	180	210	220	360	480	500	600	600	600	600	600	126
1-2	180	210	220	360	480	540	600	600	600	600	600	126
9-16	180	210	220	360	430	480	550	600	600	600	600	126
5-8	180	210	220	360	400	430	500	580	600	600	600	126
11-16	180	210	220	320	350	400	450	530	600	600	600	126
3-4	180	210	220	300	320	360	410	480	570	600	600	126
13-16	180	210	220	260	300	330	380	440	530	600	600	126
7-8	180	210	220	250	280	310	350	410	500	600	600	126
15-16	180	200	210	230	260	300	330	390	460	580	600	126
1	180	190	200	220	240	270	310	360	430	540	600	126
1 1-8	160	170	180	190	220	240	280	320	390	480	600	124
1 1-4	144	150	160	180	200	220	250	290	350	440	580	122
1 1-2	144	150	160	180	200	220	250	290	290	360	480	122
1 3-4	....	125	130	140	160	180	210	240	290	360	480	120
2	....	....	120	130	140	160	190	220	260	330	440	115

UNIVERSAL MILL PLATES.

Thickness Inches.	Width in Inches.									
	48-46 Inclu sive	45-41 Inclu sive	40-36 Inclu sive	35-31 Inclu sive	30-26 Inclu sive	25-21 Inclu sive	20-17 Inclu sive	16-15 Inclu sive	14-11 Inclu sive	10-7 Inclu sive
1-4	....	....	....	....	....	540	540	540	540	540
5-16	....	....	....	480	480	600	600	600	600	600
3-8	840	840	960	1080	1080	1200	1200	960	900	840
7-16	960	960	960	1080	1080	1200	1200	960	900	840
1-2	960	960	1080	1080	1140	1140	1140	1020	1020	840
9-16	960	960	1080	1080	1080	1080	1080	1020	1020	840
5-8	960	960	960	960	1020	1020	1020	1020	1020	840
3-4	780	780	780	780	780	900	960	960	900	840
7-8	600	600	600	600	720	840	960	960	900	840
1	420	420	480	540	600	780	900	960	900	840
1 1-8	360	360	420	480	480	720	780	780	840	840
1 1-4	324	324	360	420	480	600	720	780	840	840
1 3-8	324	300	300	360	360	540	600	780	840	840
1 1-2	300	300	300	300	360	480	600	720	840	840
1 5-8	240	240	240	240	300	300	300	660	840	840
1 3-4	240	240	240	240	300	300	300	240	....	....
1 7-8	180	180	180	180	240	240	240	180	....	....
2	180	180	180	180	240	240	240	180	....	....

Plates of greater dimensions than shown in the above table may be submitted for special consideration.

Both Sheared and Universal Mill Plates of extreme dimensions, as shown in the above tables, are subject to special prices.

SHEET STEEL.

Thickness.	WIDTHS											
	64	62	60	58	56	54	50	48	42	36	30	24
LENGTHS												
8 & 9	144	216	240	240	240	264	300	300	300	300	300	300
10	....	144	192	192	192	240	240	300	300	300	300	300
11 & 12	....	....	144	144	144	156	192	192	240	240	240	240

WEIGHTS OF SHEETS AND PLATES.

Estimated weight by standard gauges.

No. of Gauge or Thickness of Sheet	Approximate Thickness in Inches.				Weight per Square Foot in Pounds.					
	U. S. Standard adopted by U. S. Government July 1, 1893.		Birmingham Wire Gauge		U. S. Standard	Mill Standard	Birmingham Wire Gauge	American or Brown & Sharpe's		
	Frac-tions.	Deci-mals.	Deci-mals.	Deci-mals.				STEEL	IRON	
7-0's	1-2	.5	.....	.....	20.00	20.4	.....	.....	.....	.....
6-0's	15-32	.468	.....	.....	18.75	19.125	.....	.....	.....	.....
5-0's	7-16	.437	.....	.....	17.50	17.85	.....	.....	.....	.....
0000	13-32	.406	.454	.46	16.25	16.575	18.46	18.22	18.77	18.40
000	3-8	.375	.425	.409	15.	15.30	17.28	17.05	16.71	16.88
00	11-32	.343	.38	.364	13.75	14.025	15.45	15.25	14.88	14.59
0	5-16	.312	.34	.324	12.50	12.75	13.82	13.64	13.26	13.00
1	9-32	.281	.30	.289	11.25	11.475	12.20	12.04	11.80	11.57
2	17-64	.265	.284	.257	10.625	10.8375	11.55	11.40	10.51	10.30
3	1-4	.25	.259	.229	10.	10.2	10.53	10.39	9.36	9.18
4	15-64	.234	.238	.204	9.375	9.5625	9.68	9.55	8.34	8.17
5	7-32	.218	.22	.181	8.75	8.925	8.95	8.83	7.42	7.28
6	13-64	.203	.203	.162	8.125	8.2875	8.25	8.15	6.61	6.48
7	3-16	.187	.18	.144	7.5	7.65	7.32	7.22	5.89	5.77
8	11-64	.171	.165	.128	6.875	7.0125	6.74	6.62	5.24	5.14
9	5-32	.156	.148	.114	6.25	6.375	6.02	5.94	4.67	4.58
10	9-64	.140	.134	.101	5.625	5.7375	5.45	5.38	4.16	4.08
11	1-8	.125	.12	.09	5.	5.1	4.88	4.82	3.70	3.63
12	7-64	.109	.109	.08	4.375	4.625	4.43	4.37	3.30	3.23
13	3-32	.093	.095	.072	3.75	3.825	3.86	3.81	2.94	2.88
14	5-64	.078	.083	.064	3.125	3.1875	3.37	3.33	2.62	2.56
15	9-128	.070	.072	.057	2.8125	2.86875	2.93	2.89	2.33	2.28
16	1-16	.062	.065	.05	2.5	2.55	2.64	2.61	2.07	2.03
17	9-160	.056	.058	.045	2.25	2.295	2.36	2.33	1.85	1.81
18	1-20	.05	.049	.04	2.	2.04	1.99	1.97	1.64	1.61
19	7-160	.043	.042	.035	1.75	1.785	1.71	1.69	1.46	1.44
20	3-80	.037	.035	.032	1.50	1.53	1.42	1.40	1.31	1.28
21	11-320	.034	.032	.028	1.375	1.4025	1.30	1.28	1.16	1.14
22	1-32	.031	.028	.025	1.25	1.275	1.14	1.12	1.03	1.01
23	9-320	.028	.025	.022	1.125	1.1475	1.02	1.00	.922	.904
24	1-40	.025	.022	.020	1.	1.02	.895	.883	.82	.804
25	7-320	.021	.02	.017	.875	.8925	.813	.803	.73	.716
26	3-160	.018	.018	.015	.75	.765	.732	.722	.649	.636
27	11-640	.017	.016	.014	.6875	.70125	.651	.642	.579	.568
28	1-64	.015	.014	.012	.625	.6375	.569	.562	.514	.504
29	9-640	.014	.013	.011	.5625	.57375	.....	.....	.461	.452
30	1-80	.012	.012	.01	.5	.51	.....	.....	.408	.46
31	7-640	.010	.01	.008	.4375	.44625	.....	.....	.363	.356
32	13-1280	.010	.009	.008	.4062	.414375	.....	.....	.326	.320
33	3-320	.009	.008	.007	.375	.3825	.....	.....	.29	.284
34	11-1280	.008	.007	.006	.3437	.350625	.....	.....	.257	.252
35	5-640	.007	.005	.005	.3125	.31885	.....	.....	.228	.224
36	9-1280	.007	.004	.....	.2812	.286875	.....	.....	.....	.....
37	17-2560	.006	.....	.....	.2656	.2709375	.....	.....	.....	.....
38	1-160	.006	.....	.....	.25	.255	.....	.....	.....	.....

The U. S. Standard Gauge is the one commonly used in the United States. In figuring weights of Steel Plates add to above the allowances for over-weight, adopted by Association American Steel Manufacturers, as shown on page 250.

All steel sheets in our stock ARE rolled to the U. S. Standard Gauge.

WEIGHTS OF STEEL BOILER HEADS.

Estimated weight. Showing sizes we can furnish.

Dia. of Heads in inches	Thickness of Heads.														
	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	1
16	7	11	14	18	22	25	29	...	...	...	...	...	...	...	...
18	9	14	18	23	27	32	36	...	...	...	...	...	...	...	...
20	11	17	23	28	34	39	45	...	...	...	...	...	...	...	...
22	14	20	27	34	41	48	55	...	...	...	...	...	...	...	...
24	16	24	32	41	49	57	65	...	...	...	...	...	...	...	...
26	19	29	38	47	57	67	76	...	...	...	...	...	...	...	...
28	22	33	44	55	66	77	88	...	...	...	...	...	...	...	...
30	25	38	51	63	76	89	101	...	...	...	...	...	...	...	...
32	29	43	58	72	86	101	115	...	...	...	...	...	...	...	...
34	33	49	65	81	98	114	130	...	...	...	...	...	...	...	...
36	37	55	73	91	109	128	146	162	178	194	210	...	...	...	...
38	41	61	81	102	123	142	163	182	201	220	239	...	...	...	...
40	45	68	90	113	135	158	180	203	225	247	269	...	...	...	...
42	50	75	99	124	149	174	199	223	248	272	297	...	...	...	...
44	55	82	109	136	164	191	218	245	273	301	329	...	...	...	...
46	60	89	119	149	179	209	239	268	299	328	358	...	...	...	...
48	65	97	130	162	195	227	259	292	324	357	390	...	...	...	...
50	...	106	141	176	211	246	281	317	352	387	422	...	...	...	...
52½	...	115	153	192	230	268	307	346	385	423	461	...	...	...	...
54	...	123	164	205	246	287	328	369	410	451	492	...	...	...	...
56	...	132	177	221	265	309	353	397	441	485	530	...	...	...	...
58½	...	133	190	239	286	333	382	430	447	525	572	...	...	...	...
59	...	147	196	245	294	343	392	441	490	539	588	...	...	...	...
60	...	154	204	254	305	356	408	457	510	561	612	...	...	...	...
62	...	165	219	273	328	382	437	492	546	601	656	...	...	...	...
64	...	175	233	291	349	407	466	524	582	640	699	...	...	...	...
65	...	181	240	300	360	420	480	540	600	661	721	...	...	...	...
66	...	186	248	310	371	433	495	557	619	681	743	...	...	...	...
68	...	198	263	329	394	460	526	591	657	723	789	...	...	...	...
70	...	210	279	348	418	487	557	627	696	766	836	...	...	...	...
71	...	217	287	358	430	502	573	645	717	788	860	...	...	...	...
72	...	222	295	368	442	516	589	663	737	810	884	...	...	...	...
74	...	234	311	389	467	545	623	700	778	856	934	...	...	...	...
76	...	247	328	410	492	575	657	739	821	903	985	1067	1149	1231	1313
77	...	...	337	421	506	590	674	758	843	927	1011	1095	1180	1264	1348
78	...	...	346	432	519	605	692	778	865	951	1038	1124	1210	1297	1383
80	...	...	467	458	550	641	733	830	917	1008	1100	1192	1283	1384	1476
82	...	...	388	485	582	679	776	872	969	1066	1163	1260	1357	1454	1551
84	...	...	407	509	610	712	814	916	1017	1119	1221	1322	1424	1526	1628
86	...	...	427	533	640	746	853	960	1066	1173	1280	1386	1493	1599	1706
88	...	...	447	558	670	782	893	1005	1117	1228	1340	1452	1563	1675	1787
89	...	...	457	571	685	799	914	1028	1142	1256	1370	1485	1599	1712	1827
90	...	...	467	584	701	817	934	1051	1168	1285	1401	1518	1635	1752	1869
92	...	...	508	610	732	854	976	1098	1220	1342	1463	1586	1708	1830	1953
94	...	...	530	637	764	892	1019	1146	1274	1401	1529	1656	1783	1911	2038
96	...	...	553	664	797	930	1063	1196	1329	1462	1594	1727	1860	1993	2126
98	...	...	576	692	831	969	1108	1246	1384	1523	1662	1800	1939	2077	2215
100	...	...	600	721	865	1009	1153	1297	1442	1585	1730	1874	2018	2163	2307
101	...	...	612	735	882	1029	1175	1322	1470	1616	1764	1910	2058	2205	2352
102	...	...	...	750	899	1048	1197	1347	1498	1647	1798	1947	2098	2248	2398
103	...	...	...	764	916	1068	1219	1372	1525	1678	1832	1984	2138	2291	2444
104	...	...	...	779	933	1087	1241	1395	1551	1706	1862	2023	2178	2333	2488
106	...	...	...	808	967	1127	1286	1445	1605	1765	1926	2090	2254	2416	2578
108	...	...	...	836	1001	1166	1331	1496	1660	1827	1994	2162	2331	2499	2666
110	...	...	...	865	1035	1205	1376	1547	1717	1888	2060	2232	2405	2580	2753
112	...	...	...	894	1069	1245	1420	1596	1773	1950	2128	2306	2484	2663	2842
114	...	...	...	923	1103	1284	1464	1645	1827	2010	2194	2377	2560	2745	2930
116	...	...	...	985	1168	1350	1533	1716	1898	2081	2263	2446	2628	2811	2993
118	...	...	...	1026	1216	1406	1596	1786	1976	2166	2356	2546	2736	2926	3116
120	...	...	...	1060	1256	1452	1649	1845	2041	2237	2434	2630	2826	3022	3219
122	...	...	...	1093	1296	1499	1701	1904	2106	2309	2511	2714	2916	3119	3321
124	...	...	...	1134	1344	1544	1764	1974	2184	2394	2604	2814	3024	3234	3444
126	...	...	...	1168	1384	1600	1817	2033	2249	2465	2682	2898	3114	3330	3547

In figuring weight of Steel Heads, add to above the allowances for over-weight adopted by Ass'n Am. Steel Manufacturers, as shown on page 250.

ESTIMATED WEIGHTS OF BLACK SHEETS.

U. S. Standard Gauge. Weight per Sheet in lbs.

U. S. Gauge	10	12	14	15	16	18	20	22	24	26	27	28	29	30
Lbs. sq. ft.	5.625	4.375	3.125	2.8125	2.50	2.00	1.50	1.25	1.00	.75	.6875	.625	.5625	.50
Thick. (in.)	9-64	7-64	5-64	9-128	1-16	1-20	3-80	1-32	1-40	3-160	11-640	1-64	9-640	1-80
24x96	90.00	70.00	50.00	45.00	40.00	32.00	24.00	20.00	16.00	12.00	11.00	10.00	9.00	8.00
101	94.69	73.65	52.60	47.34	42.08	33.67	25.25	21.04	16.84	12.63	11.57	10.52	9.47	8.42
108	101.25	78.75	56.25	50.63	45.00	36.00	27.00	22.50	18.00	13.50	12.38	11.25	10.13	9.00
120	112.50	87.50	62.50	56.25	50.00	40.00	30.00	25.00	20.00	15.00	13.75	12.50	11.25	10.00
26x96	97.50	75.83	54.17	48.75	43.33	34.67	26.00	21.67	17.34	13.00	11.92	10.83	9.75	8.67
101	102.58	79.78	57.00	51.29	45.59	36.47	27.35	22.79	18.24	13.68	12.54	11.40	10.26	9.12
108	109.69	85.31	60.94	54.84	48.75	39.00	29.25	24.37	19.50	14.63	13.41	12.19	10.97	9.75
120	121.88	94.79	67.71	60.94	54.17	43.33	32.50	27.06	21.67	16.25	14.90	13.54	12.19	10.83
28x96	105.00	81.67	58.33	52.50	46.67	37.33	28.00	23.33	18.67	14.00	12.83	11.67	10.50	9.33
108	118.13	91.88	65.63	59.06	52.50	42.00	31.50	26.25	21.00	15.75	14.44	13.13	11.81	10.50
120	131.25	102.08	72.92	65.63	58.33	46.67	35.00	29.17	23.33	17.50	16.04	14.58	13.13	11.67
30x96	112.50	87.50	62.50	56.25	50.00	40.00	30.00	25.00	20.00	15.00	13.75	12.50	11.25	10.00
101	118.36	92.06	65.76	59.18	52.60	42.08	31.56	26.30	21.04	15.78	14.47	13.15	11.81	10.50
108	126.56	98.44	70.31	62.69	56.25	45.00	33.75	28.12	22.50	16.88	15.47	14.06	12.63	11.25
120	140.63	109.38	78.13	70.31	62.50	50.00	37.50	31.25	25.00	18.75	17.19	15.63	14.06	12.50
36x77	108.28	84.22	60.17	54.14	48.13	38.50	28.88	24.06	19.25	14.44	13.23	12.03	10.83	9.63
96	135.00	105.00	75.00	67.50	60.00	48.00	36.00	30.00	24.00	18.00	16.50	15.00	13.50	12.00
108	151.88	118.13	84.38	75.94	67.50	54.00	40.50	33.75	27.00	20.25	18.56	16.88	15.19	13.50
120	168.75	131.25	93.75	84.38	75.00	60.00	45.00	37.50	30.00	22.50	20.63	18.75	16.88	15.00
42x96	157.50	122.50	87.50	78.75	70.00	56.00	42.00	35.00	28.00	21.00	19.25	17.50	15.75	14.00
120	196.88	153.13	109.38	98.44	87.50	70.00	52.51	43.75	35.00	26.25	24.06	21.88	19.69	17.50
48x77	144.38	112.29	80.21	72.19	64.17	51.33	38.50	32.08	25.67	19.25	17.65	16.04	14.43	12.81
96	180.00	140.00	100.00	90.00	80.00	64.00	48.00	40.00	32.00	24.00	22.00	20.00	18.00	16.00
108	202.50	157.50	112.50	101.25	90.00	72.00	54.00	45.00	36.00	27.00	24.75	22.50	20.25	18.00
120	225.00	175.00	125.00	112.50	100.00	80.00	60.00	50.00	40.00	30.00	27.50	25.00	22.50	20.00
138	258.75	201.25	143.75	129.38	115.00	92.00	69.00	57.50	46.00	34.50	31.63	28.75	25.88	23.00
144	270.00	210.00	150.00	135.00	120.00	96.00	72.00	60.00	48.00	36.00	33.00	30.00	27.00	24.00
54x96	201.50	157.50	112.50	100.00	90.00	72.00	54.00	45.00	36.00	27.00	24.75	22.50	20.25	18.00
108	227.82	177.20	126.57	112.50	100.00	80.00	60.00	50.00	40.00	30.00	27.50	25.00	22.50	20.00
120	253.13	196.88	140.63	126.57	112.50	90.00	70.00	60.00	50.00	40.00	37.50	35.00	32.50	30.00
138	291.09	218.21	161.71	143.75	129.38	104.00	80.00	66.00	52.00	42.00	39.00	36.00	33.00	30.00
144	303.75	236.25	168.75	150.00	135.00	110.00	86.00	72.00	58.00	48.00	45.00	42.00	39.00	36.00
60x96	225.00	175.00	125.00	112.50	100.00	80.00	60.00	50.00	40.00	30.00	27.50	25.00	22.50	20.00
108	253.12	196.88	140.63	126.57	112.50	90.00	70.00	60.00	50.00	40.00	37.50	35.00	32.50	30.00
120	281.25	219.36	161.71	143.75	129.38	104.00	80.00	66.00	52.00	42.00	39.00	36.00	33.00	30.00
138	328.44	251.56	187.50	164.06	145.83	116.67	91.67	76.67	61.67	51.67	48.33	45.00	41.67	38.33
144	337.50	262.50	193.75	168.75	150.00	120.00	96.00	80.00	64.00	52.00	49.00	46.00	43.00	40.00

NOTE.

Above estimated weights are based on U. S. Standard gauge for Iron. For Steel, add 2 per cent. These figures are given for convenience in estimating only, and may vary somewhat in actual practice. The sizes below the heavy black line will probably considerably exceed the weights given, and it is safe, therefore, to allow for an overweight of at least 10 per cent.

ESTIMATING WEIGHTS OF IRON AND STEEL.

Thickness in Inches.	Weight per Sq. Foot.		Thickness in Inches.	Weight per Sq. Foot.	
	IRON.	STEEL.		IRON.	STEEL.
1-32	1.263	1.35	11-16	27.79	28.50
1-16	2.526	2.75	3-4	30.31	31.00
3-32	3.789	4.00	13-16	32.84	33.50
1-8	5.052	5.35	7-8	35.37	36.00
5-32	6.315	6.75	15-16	37.89	38.50
3-16	7.578	7.85	1	40.42	41.00
7-32	8.841	9.25	1 1-16	42.50	43.50
1-4	10.10	11.00	1 1-8	45.00	46.00
9-32	11.37	11.75	1 3-16	47.50	48.50
5-16	12.63	13.50	11-4	50.00	51.00
11-32	13.89	14.25	1 5-16	52.50	53.50
3-8	15.16	16.00	1 3-8	55.00	56.10
13-32	16.42	16.75	1 7-16	57.50	58.65
7-16	17.68	18.50	1 1-2	60.00	61.20
15-32	18.95	19.25	1 3-4	70.73	71.40
1-2	20.21	21.00	1 7-8	75.00	76.50
9-16	22.73	23.50	2	80.83	81.60
5-8	25.26	26.00			

EST'D WEIGHTS OF GALVANIZED SHEETS.

U. S. Stan'd Gauge	10	12	14	16	18	20	22	24	25	26	27	28	29	30
Weight per sq. ft. lbs. }	5.781	4.531	3.281	2.656	2.156	1.656	1.406	1.156	1.031	.9062	.8437	.7812	.7187	.6562
Weight per sq. ft. oz. }	92.5	72.5	52.5	42.5	34.5	26.5	22.5	18.5	16.5	14.5	13.5	12.5	11.5	10.5

Size Sheet

WEIGHT OF SHEET—POUNDS

24 x 72	69	54	39	32	26	20	17	14	12	11	10	9	9	8
24 x 84	81	63	46	37	30	23	20	16	14	13	12	11	10	9
24 x 96	93	73	53	43	35	27	23	19	17	15	14	13	12	11
24 x 120	116	91	66	53	43	33	28	23	21	18	17	16	14	13
26 x 72	75	59	43	35	28	22	18	15	13	12	11	10	9	9
26 x 84	88	69	50	40	33	25	21	18	16	14	13	12	11	10
26 x 96	100	79	57	46	37	29	24	20	18	16	15	14	12	11
26 x 120	125	98	71	58	47	36	30	25	22	20	18	17	16	14
28 x 72	81	63	46	37	30	23	20	16	14	13	12	11	10	9
28 x 84	94	74	54	43	35	27	23	19	17	15	14	13	12	11
28 x 96	108	85	61	50	40	31	26	22	19	17	16	15	13	12
28 x 120	135	106	77	62	50	39	33	27	24	21	20	18	17	15
30 x 72	87	68	49	40	32	25	21	17	15	14	13	12	11	10
30 x 84	101	79	57	46	38	29	25	20	18	16	15	14	13	11
30 x 96	116	91	66	53	43	33	28	23	21	18	17	16	14	13
30 x 120	145	113	82	66	54	41	35	29	26	23	21	20	18	16
36 x 72	104	82	59	48	39	30	25	21	19	16	15	14	13	12
36 x 84	121	95	69	55	45	35	30	24	22	19	18	16	15	14
36 x 96	139	109	79	64	52	40	34	28	25	22	20	19	17	16
36 x 120	173	136	98	80	65	50	42	35	31	27	25	23	22	20
42 x 72	121	95	71	56	45	34	29	24	22	19	18	16	15	14
42 x 84	142	111	80	65	53	41	34	28	25	22	21	19	18	16
42 x 96	162	127	92	74	60	46	39	32	29	25	24	22	20	18
42 x 120	202	159	115	93	75	58	49	41	36	33	29	27	25	23
48 x 72	139	109	79	64	52	40	34	28	25	22	20	19	17	16
48 x 84	162	125	92	74	60	46	39	32	29	25	24	22	20	18
48 x 96	185	145	105	85	69	55	45	37	33	29	27	25	23	21
48 x 120	231	181	131	106	86	66	56	46	41	36	34	31	29	

WRITE FOR DISCOUNTS.

WEIGHTS OF ROUND AND SQUARE STEEL.

Estimated weight per lineal foot. One cubic foot of steel weighs 490 lbs.

Sizes in Inches.	● Weight in Lbs.	■ Weight in Lbs.	Sizes in Inches.	● Weight in Lbs.	■ Weight in Lbs.	Sizes in Inches.	● Weight in Lbs.	■ Weight in Lbs.
$\frac{1}{8}$	.010	.013	$4\frac{1}{8}$	44.07	56.11	$8\frac{1}{8}$	173.6	221.0
$\frac{1}{4}$	.042	.053	$4\frac{1}{4}$	45.44	57.85	$8\frac{1}{4}$	176.3	224.5
$\frac{3}{8}$	.094	.119	$4\frac{3}{8}$	46.83	59.62	$8\frac{3}{8}$	179.0	228.0
$\frac{1}{2}$	.167	.212	$4\frac{1}{2}$	48.24	61.41	$8\frac{1}{2}$	181.8	231.4
$\frac{5}{8}$	.261	.333	$4\frac{5}{8}$	49.66	63.23	$8\frac{5}{8}$	184.5	234.9
$\frac{3}{4}$	.375	.478	$4\frac{3}{4}$	51.11	65.08	$8\frac{3}{4}$	187.3	238.5
$\frac{7}{8}$	.511	.651	$4\frac{7}{8}$	52.58	66.95	$8\frac{7}{8}$	190.1	242.0
1	.667	.850	$4\frac{7}{8}$	54.07	68.85	$8\frac{7}{8}$	193.0	245.6
$1\frac{1}{8}$	.845	1.076	$4\frac{7}{8}$	55.59	70.78	$8\frac{7}{8}$	195.7	249.3
$1\frac{1}{4}$	1.043	1.328	$4\frac{7}{8}$	57.12	72.73	$8\frac{7}{8}$	198.7	252.9
$1\frac{1}{2}$	1.262	1.608	$4\frac{7}{8}$	58.67	74.70	$8\frac{7}{8}$	201.6	256.6
$1\frac{3}{4}$	1.502	1.913	$4\frac{7}{8}$	60.25	76.71	$8\frac{7}{8}$	204.4	260.3
$1\frac{7}{8}$	1.773	2.245	$4\frac{7}{8}$	61.84	78.74	$8\frac{7}{8}$	207.4	264.1
2	2.044	2.603	$4\frac{7}{8}$	63.46	80.81	$8\frac{7}{8}$	210.3	267.9
$2\frac{1}{8}$	2.347	2.989	$4\frac{7}{8}$	65.10	82.89	$8\frac{7}{8}$	213.3	271.6
$2\frac{1}{4}$	2.670	3.400	5	66.76	85.00	9	216.3	275.4
$2\frac{1}{2}$	3.014	3.838	$5\frac{1}{8}$	68.44	87.14	$9\frac{1}{8}$	219.3	279.3
$2\frac{3}{4}$	3.379	4.303	$5\frac{1}{4}$	70.14	89.30	$9\frac{1}{4}$	222.4	283.2
$2\frac{7}{8}$	3.766	4.795	$5\frac{1}{2}$	71.86	91.49	$9\frac{1}{2}$	225.4	287.0
3	4.173	5.312	$5\frac{3}{8}$	73.60	93.72	$9\frac{3}{8}$	228.5	290.9
$3\frac{1}{8}$	4.600	5.857	$5\frac{1}{2}$	75.37	95.96	$9\frac{1}{2}$	231.5	294.9
$3\frac{1}{4}$	5.049	6.428	$5\frac{3}{4}$	77.15	98.23	$9\frac{3}{4}$	234.7	298.9
$3\frac{1}{2}$	5.518	7.026	$5\frac{3}{4}$	78.95	100.5	$9\frac{3}{4}$	237.9	302.8
$3\frac{3}{4}$	6.008	7.650	$5\frac{3}{4}$	80.77	102.8	$9\frac{3}{4}$	241.0	306.8
$3\frac{7}{8}$	6.520	8.301	$5\frac{3}{4}$	82.62	105.2	$9\frac{3}{4}$	244.2	310.9
4	7.051	8.978	$5\frac{3}{4}$	84.49	107.6	$9\frac{3}{4}$	247.4	315.0
$4\frac{1}{8}$	7.604	9.682	$5\frac{3}{4}$	86.38	110.0	$9\frac{3}{4}$	250.6	319.1
$4\frac{1}{4}$	8.178	10.41	$5\frac{3}{4}$	88.29	112.4	$9\frac{3}{4}$	253.9	323.2
$4\frac{1}{2}$	8.773	11.17	$5\frac{3}{4}$	90.22	114.9	$9\frac{3}{4}$	257.1	327.4
$4\frac{3}{4}$	9.388	11.95	$5\frac{3}{4}$	92.17	117.4	$9\frac{3}{4}$	260.4	331.6
$4\frac{7}{8}$	10.02	12.76	$5\frac{3}{4}$	94.14	119.9	$9\frac{3}{4}$	263.7	335.8
5	10.68	13.60	6	96.14	122.4	10	267.0	340.0
$5\frac{1}{8}$	11.36	14.46	$6\frac{1}{8}$	98.14	125.0	$10\frac{1}{8}$	270.4	344.3
$5\frac{1}{4}$	12.06	15.35	$6\frac{1}{4}$	100.2	127.6	$10\frac{1}{4}$	273.8	348.5
$5\frac{1}{2}$	12.78	16.27	$6\frac{1}{2}$	102.2	130.2	$10\frac{1}{2}$	277.1	352.9
$5\frac{3}{4}$	13.52	17.22	$6\frac{3}{4}$	104.3	132.8	$10\frac{3}{4}$	280.6	357.2
$5\frac{7}{8}$	14.28	18.19	$6\frac{7}{8}$	106.4	135.5	$10\frac{7}{8}$	284.0	361.6
6	15.07	19.18	$6\frac{7}{8}$	108.5	138.2	$10\frac{7}{8}$	287.4	366.0
$6\frac{1}{8}$	15.86	20.20	$6\frac{7}{8}$	110.7	140.9	$10\frac{7}{8}$	290.9	370.4
$6\frac{1}{4}$	16.69	21.25	$6\frac{7}{8}$	112.8	143.6	$10\frac{7}{8}$	294.4	374.9
$6\frac{1}{2}$	17.53	22.33	$6\frac{7}{8}$	114.9	146.5	$10\frac{7}{8}$	297.9	379.4
$6\frac{3}{4}$	18.40	23.43	$6\frac{7}{8}$	117.2	149.2	$10\frac{7}{8}$	301.4	383.8
$6\frac{7}{8}$	19.29	24.56	$6\frac{7}{8}$	119.4	152.1	$10\frac{7}{8}$	305.0	388.3
7	20.20	25.00	$6\frac{7}{8}$	121.7	154.9	$10\frac{7}{8}$	308.6	392.9
$7\frac{1}{8}$	21.12	26.90	$6\frac{7}{8}$	123.9	157.8	$10\frac{7}{8}$	312.2	397.5
$7\frac{1}{4}$	22.07	28.10	$6\frac{7}{8}$	126.2	160.8	$10\frac{7}{8}$	315.8	402.1
$7\frac{1}{2}$	23.04	29.34	$6\frac{7}{8}$	128.5	163.6	$10\frac{7}{8}$	319.5	406.8
$7\frac{3}{4}$	24.03	30.60	7	130.9	166.6	11	323.1	411.4
$7\frac{7}{8}$	25.04	31.89	$7\frac{1}{8}$	133.2	169.6	$11\frac{1}{8}$	326.8	416.1
8	26.08	33.20	$7\frac{1}{4}$	135.6	172.6	$11\frac{1}{4}$	330.5	420.9
$8\frac{1}{8}$	27.13	34.55	$7\frac{1}{2}$	137.9	175.6	$11\frac{1}{2}$	334.3	425.5
$8\frac{1}{4}$	28.20	35.92	$7\frac{1}{2}$	140.4	178.7	$11\frac{1}{2}$	337.9	430.3
$8\frac{1}{2}$	29.30	37.31	$7\frac{1}{2}$	142.8	181.8	$11\frac{1}{2}$	341.7	435.1
$8\frac{3}{4}$	30.42	38.73	$7\frac{1}{2}$	145.3	184.9	$11\frac{1}{2}$	345.5	439.9
$8\frac{7}{8}$	31.56	40.18	$7\frac{1}{2}$	147.7	188.1	$11\frac{1}{2}$	349.4	444.8
9	32.71	41.65	$7\frac{1}{2}$	150.2	191.3	$11\frac{1}{2}$	353.1	449.6
$9\frac{1}{8}$	33.90	43.14	$7\frac{1}{2}$	152.7	194.4	$11\frac{1}{2}$	357.0	454.5
$9\frac{1}{4}$	35.09	44.68	$7\frac{1}{2}$	155.2	197.7	$11\frac{1}{2}$	360.9	459.5
$9\frac{1}{2}$	36.31	46.24	$7\frac{1}{2}$	157.8	200.9	$11\frac{1}{2}$	364.8	464.4
$9\frac{3}{4}$	37.56	47.82	$7\frac{1}{2}$	160.3	204.2	$11\frac{1}{2}$	368.6	469.4
$9\frac{7}{8}$	38.81	49.42	$7\frac{1}{2}$	163.0	207.6	$11\frac{1}{2}$	372.6	474.4
10	40.10	51.05	$7\frac{1}{2}$	165.6	210.8	$11\frac{1}{2}$	376.6	479.5
$10\frac{1}{8}$	41.40	52.71	$7\frac{1}{2}$	168.2	214.2	$11\frac{1}{2}$	380.6	484.5
$10\frac{1}{4}$	42.73	54.40	8	171.0	217.6			

WEIGHTS OF FLAT STEEL BARS.

Estimated weight per lineal foot.

Wide	THICKNESS																1 in.
	1-16	1-8	3-16	1-4	5-16	3-8	7-16	1-2	9-16	5-8	11-16	3-4	13-16	7-8	15-16		
1 in.	.2125	.425	.638	.85	1.06	1.28	1.49	.170	.192	2.12	2.34	2.55	2.76	2.98	3.19	3.40	
1 1/4 in.	.265	.53	.797	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.19	3.45	3.72	3.99	4.25	
1 1/2 in.	.32	.64	.957	1.28	1.59	1.92	2.23	2.55	2.87	3.19	3.51	3.83	4.14	4.47	4.78	5.10	
1 3/4 in.	.3725	.745	1.11	1.49	1.86	2.23	2.60	2.98	3.35	3.72	4.09	4.47	4.84	5.20	5.58	5.95	
2 in.	.425	.85	1.28	1.70	2.12	2.55	2.98	3.40	3.83	4.25	4.67	5.10	5.53	5.95	6.38	6.80	
2 1/4 in.	.4775	.955	1.44	1.91	2.39	2.87	3.35	3.83	4.30	4.78	5.26	5.75	6.21	6.69	7.18	7.65	
2 1/2 in.	.53	1.06	1.59	2.12	2.65	3.19	3.72	4.25	4.78	5.31	5.84	6.38	6.90	7.44	7.97	8.50	
2 3/4 in.	.585	1.17	1.75	2.34	2.92	3.51	4.09	4.67	5.26	5.84	6.43	7.02	7.60	8.18	8.77	9.35	
3 in.	.6375	1.275	1.91	2.55	3.19	3.83	4.46	5.10	5.74	6.38	7.02	7.65	8.29	8.93	9.57	10.20	
3 1/4 in.	.69	1.38	2.07	2.78	3.45	4.15	4.83	5.53	6.22	6.91	7.60	8.29	8.98	9.67	10.36	11.05	
3 1/2 in.	.745	1.49	2.23	2.98	3.72	4.47	5.20	5.95	6.70	7.44	8.18	8.93	9.67	10.41	11.16	11.90	
3 3/4 in.	.7975	1.595	2.39	3.19	3.99	4.78	5.58	6.38	7.17	7.97	8.76	9.57	10.36	11.16	11.95	12.75	
4 in.	.85	1.70	2.55	3.40	4.25	5.10	5.95	6.80	7.65	8.50	9.35	10.20	11.05	11.90	12.75	13.60	
4 1/4 in.	.9025	1.805	2.71	3.61	4.52	5.42	6.32	7.22	8.13	9.03	9.93	10.84	11.74	12.65	13.55	14.45	
4 1/2 in.	.9575	1.915	2.87	3.83	4.78	5.74	6.70	7.65	8.61	9.57	10.52	11.48	12.43	13.39	14.34	15.30	
4 3/4 in.	1.01	2.02	3.03	4.04	5.05	6.06	7.07	8.08	9.09	10.10	11.11	12.12	13.12	14.13	15.14	16.15	
5 in.	1.0625	2.125	3.19	4.25	5.31	6.38	7.44	8.50	9.57	10.63	11.69	12.75	13.81	14.87	15.94	17.00	
5 1/4 in.	1.115	2.23	3.35	4.46	5.58	6.69	7.79	8.89	9.99	11.09	12.19	13.29	14.39	15.49	16.59	17.69	
5 1/2 in.	1.1675	2.335	3.51	4.67	5.84	7.02	8.18	9.35	10.52	11.69	12.85	14.03	15.19	16.36	17.53	18.70	
5 3/4 in.	1.2225	2.445	3.67	4.89	6.11	7.34	8.56	9.77	11.00	12.22	13.44	14.67	15.89	17.10	18.33	19.55	
6 in.	1.275	2.55	3.83	5.10	6.38	7.65	8.93	10.20	11.48	12.75	14.03	15.30	16.58	17.85	19.13	20.40	
6 1/4 in.	1.3275	2.655	3.99	5.31	6.64	7.97	9.29	10.63	11.95	13.28	14.61	15.94	17.27	18.60	19.92	21.25	
6 1/2 in.	1.3825	2.765	4.14	5.53	6.98	8.29	9.67	11.05	12.43	13.81	15.20	16.58	17.95	19.34	20.72	22.10	
6 3/4 in.	1.435	2.87	4.30	5.74	7.17	8.61	10.04	11.48	12.91	14.34	15.78	17.22	18.65	20.08	21.52	22.95	
7 in.	1.4875	2.975	4.46	5.95	7.44	8.93	10.41	11.90	13.39	14.87	16.36	17.85	19.34	20.83	22.32	23.80	
7 1/4 in.	1.54	3.08	4.62	6.16	7.70	9.25	10.78	12.32	13.86	15.40	16.94	18.49	20.03	21.57	23.11	24.65	
7 1/2 in.	1.59	3.18	4.78	6.36	7.97	9.57	11.16	12.75	14.34	15.94	17.53	19.13	20.72	22.32	23.92	25.50	
7 3/4 in.	1.645	3.29	4.94	6.58	8.23	9.88	11.53	13.18	14.82	16.47	18.12	19.77	21.41	23.05	24.70	26.35	
8 in.	1.70	3.40	5.10	6.80	8.50	10.20	11.90	13.60	15.30	17.00	18.70	20.40	22.10	23.80	25.50	27.20	
8 1/4 in.	1.7525	3.505	5.26	7.01	8.76	10.52	12.27	14.03	15.78	17.53	19.28	21.04	22.79	24.55	26.30	28.05	
8 1/2 in.	1.8055	3.61	5.42	7.22	9.03	10.84	12.64	14.44	16.26	18.06	19.86	21.68	23.48	25.30	27.10	28.90	
8 3/4 in.	1.8575	3.715	5.58	7.43	9.29	11.10	13.02	14.87	16.74	18.59	20.45	22.32	24.17	26.04	27.89	29.75	
9 in.	1.9125	3.825	5.74	7.65	9.56	11.48	13.40	15.30	17.22	19.13	21.04	22.96	24.86	26.78	28.69	30.60	
9 1/4 in.	1.965	3.93	5.80	7.86	9.83	11.80	13.76	15.73	17.69	19.65	21.62	23.59	25.55	27.52	29.49	31.45	
9 1/2 in.	2.02	4.04	6.06	8.08	10.10	12.12	14.14	16.16	18.18	20.19	22.21	24.24	26.26	28.28	30.30	32.32	
9 3/4 in.	2.0725	4.145	6.22	8.29	10.36	12.44	14.51	16.58	18.65	20.72	22.79	24.86	26.94	29.01	31.08	33.15	
10 in.	2.125	4.25	6.38	8.50	10.62	12.75	14.88	17.00	19.14	21.25	23.38	25.50	27.62	29.75	31.88	34.00	
10 1/4 in.	2.1775	4.355	6.54	8.71	10.89	13.07	15.25	17.42	19.61	21.78	23.96	26.14	28.32	30.50	32.67	34.85	
10 1/2 in.	2.23	4.46	6.70	8.92	11.16	13.39	15.62	17.85	20.08	22.32	24.56	26.80	29.04	31.24	33.48	35.70	
10 3/4 in.	2.285	4.57	6.86	9.14	11.42	13.71	15.98	18.28	20.56	22.85	25.13	27.42	29.69	31.98	34.28	36.55	
11 in.	2.335	4.67	7.02	9.34	11.68	14.03	16.36	18.70	21.02	23.35	25.68	28.05	30.40	32.72	35.06	37.40	
11 1/4 in.	2.3925	4.785	7.17	9.57	11.95	14.35	16.74	19.13	21.51	23.91	26.30	28.68	31.08	33.47	35.86	38.25	
11 1/2 in.	2.445	4.89	7.32	9.78	12.22	14.68	17.12	19.55	22.00	24.44	26.88	29.33	31.76	34.21	36.66	39.10	
11 3/4 in.	2.50	5.00	7.49	10.00	12.49	14.99	17.49	19.97	22.48	24.97	27.47	29.97	32.46	34.95	37.46	39.95	
12 in.	2.55	5.10	7.65	10.20	12.75	15.30	17.85	20.40	22.95	25.50	28.05	30.60	33.15	35.70	38.25	40.80	
13 in.	2.765	5.53	8.28	11.06	13.51	16.58	19.34	22.10	24.86	27.62	30.39	33.16	35.91	38.68	41.44	44.20	
14 in.	2.975	5.95	8.92	11.90	14.88	17.86	20.82	23.80	26.78	29.74	32.72	35.71	38.67	41.65	44.63	47.60	
15 in.	3.1875	6.375	9.56	12.75	15.94	19.14	22.32	25.50	28.70	31.88	35.05	38.23	41.41	44.62	47.82	51.00	
16 in.	3.40	6.80	10.20	13.60	17.00	20.40	23.80	27.20	30.60	34.00	37.40	40.80	44.20	47.60	51.00	54.40	
17 in.	3.61	7.22	11.44	14.44	18.06	21.68	25.28	28.89	32.52	36.12	39.72	43.36	46.96	50.60	54.20	57.80	
18 in.	3.825	7.65	11.84	15.30	19.12	22.96	26.79	30.60	34.44	38.27	42.08	45.92	49.72	53.56	57.38	61.20	
19 in.	4.04	8.08	12.10	16.16	20.20	24.24	28.28	32.31	36.34	40.37	44.42	48.46	52.48	56.52	60.57	64.60	
20 in.	4.25	8.50	12.76	17.00	21.24	25.50	29.75	34.00	38.27	42.50	46.74	51.00	55.25	59.50	63.76	68.00	
21 in.	4.46	8.92	13.40	17.84	22.32	26.78	31.24	35.70	40.16	44.64	49.08	53.56	58.01	62.49	66.98	71.40	
22 in.	4.6725	9.345	14.04	18.69	23.28	28.06	32.72	37.40	42.04	46.76	51.50	56.10	60.79	65.44	70.13	74.80	
23 in.	4.89	9.78	14.64	19.56	24.44	29.33	34.24	39.10	44.00	48.85	53.76	58.60	63.53	68.43	73.32	78.20	
24 in.	5.10	10.20	15.32	20.40	25.52	30.60	35.72	40.80	45.92	51.00	56.12	61.20	66.29	71.40	76.50	81.60	
25 in.	5.315	10.63	15.96	21.26	26.56	31.88	37.20	42.50	47.80	53.03	58.25	63.47	68.69	73.86	79.05	84.25	
26 in.	5.53	11.06	16.56	22.12	27.63	33.16	38.64	44.20	49.73	55.24	60.76	66.28	71.82	77.36	82.88	88.40	
27 in.	5.74	11.48	17.20	22.96	28.68	34.44	40.17	45.92	51.64	57.37	63.11	68.88	74.58	80.33	86.07	91.80	
28 in.	5.95	11.90	17.84	23.60	29.70	35.72	41.65	47.60	53.56	59.49	65.44	71.42	77.34	83.30	89.26	95.20	
29 in.	6.16	12.32	18.48	24.34	30.76	37.00	43.14	49.28	55.41	61.60	67.77	73.97	80.10	86.29	92.44	98.60	
30 in.	6.375	12.75	19.12	25.50	31.88	38.28	44.64	51.00	57.40	63.76	70.13	76.53	82.91	89.24	95.64	102.00	
31 in.	6.59	13.18	19.75	26.36	32.94	39.54	46.12	52.70	59.32	65.85	72.48	79.08	85.62	92.20	98.82	105.40	
32 in.	6.80	13.60	20.40	27.20	34.00	40.80	47.60	54.40	61.22	68.00	74.80	81.61	88.39	95.20	102.00	108.80	
33 in.	7.01	14.02	21.04	28.04	35.04	42.08	49.08	56.10	63.12	70.12	77.12	84.16	91.15	98.20	105.20	112.20	
34 in.	7.22	14.44	21.68	28.88	36.12	43.36	50.57	57.78	65.04	72.24	79.44	86.72	93.91	101.20	108.4	115.8	
35 in.	7.43	14.8															


ESTIMATED WEIGHTS—Continued.**OVAL AND HALF OVAL STEEL.**

Size, Oval	Est. Wt. per Foot	Size, Half Oval	Est. Wt. per Foot
$\frac{3}{8} \times \frac{3}{16}$	.186	$\frac{3}{8} \times \frac{3}{32}$	.093
$\frac{1}{16} \times \frac{7}{32}$	.253	$\frac{1}{16} \times \frac{7}{16}$	.127
$\frac{1}{2} \times \frac{1}{4}$	.331	$\frac{1}{2} \times \frac{1}{8}$	.163
$\frac{5}{8} \times \frac{5}{16}$	.517	$\frac{5}{8} \times \frac{5}{32}$	.259
$\frac{3}{4} \times \frac{3}{8}$	.744	$\frac{3}{4} \times \frac{3}{16}$	.372
$\frac{7}{8} \times \frac{7}{16}$	1.013	$\frac{7}{8} \times \frac{7}{32}$	.507
1 x $\frac{1}{2}$	1.323	1 x $\frac{1}{4}$	.662
$1\frac{1}{8} \times \frac{9}{16}$	1.624	$1\frac{1}{8} \times \frac{9}{32}$	.812
$1\frac{1}{4} \times \frac{5}{8}$	2.087	$1\frac{1}{4} \times \frac{5}{16}$	1.032
$1\frac{1}{2} \times \frac{3}{4}$	2.976	$1\frac{1}{2} \times \frac{3}{8}$	1.488
$1\frac{3}{4} \times \frac{7}{8}$	4.059	$1\frac{3}{4} \times \frac{7}{16}$	2.026
2 x 1	5.299	2 x $\frac{1}{2}$	2.645


WAGON BOX IRON—PER LINEAL FOOT.

Width, Inches	Wire Gauge	Est. Wt. per Foot	Approx. No. of Feet in Bundle	No. of Feet in Ton, 2,000 lbs.
$\frac{3}{4}$	10	.295	380	6.770
$\frac{3}{4}$	11	.264	422	7.575
$\frac{3}{4}$	12	.233	480	8.580
$\frac{7}{8}$	10	.350	320	5.710
$\frac{7}{8}$	11	.309	362	6.470
1	10	.400	289	5.000

STEEL TIRE—ROUND EDGE.**Sets Containing 52 Feet.**

Thickness 	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Width									
$\frac{5}{8}$	23								
$\frac{3}{4}$	27	38							
$\frac{7}{8}$	32	43	54						
1	36	49	62						
$1\frac{1}{8}$		54	69	82					
$1\frac{1}{4}$		60	76	92	110	125			
$1\frac{3}{8}$			83	100	120	136			
$2\frac{3}{4}$							398	461	502
3								498	580
4								640	750

Sets Containing 50 Feet.

Thickness 	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Width								
$1\frac{1}{2}$	108	130	153	173	196			
$1\frac{5}{8}$			158	182	210			
$1\frac{3}{4}$			169	194	218	262		
$1\frac{7}{8}$			180		231			
2			191		246	300	352	405
$2\frac{1}{4}$						330	385	484
$2\frac{1}{2}$						364	426	482

STEEL TEE RAILS.



Estimated Weight per Yard	Width of Base and Height	Tons per Mile of Track
8 Pounds-	1 $\frac{5}{8}$ Inches	12 $\frac{1380}{2240}$
12 Pounds	2 Inches	18 $\frac{1920}{2240}$
16 Pounds	2 $\frac{3}{8}$ Inches	25 $\frac{280}{2240}$
20 Pounds	2 $\frac{5}{8}$ Inches	31 $\frac{960}{2240}$
25 Pounds	2 $\frac{7}{8}$ Inches	39 $\frac{640}{2240}$
30 Pounds	3 $\frac{1}{8}$ Inches	47 $\frac{320}{2240}$
35 Pounds	3 $\frac{5}{16}$ Inches	55
40 Pounds	3 $\frac{1}{2}$ Inches	62 $\frac{1280}{2240}$
45 Pounds	3 $\frac{11}{16}$ Inches	70 $\frac{1600}{2240}$
50 Pounds	3 $\frac{7}{8}$ Inches	78 $\frac{1280}{2240}$
55 Pounds	4 $\frac{1}{16}$ Inches	86 $\frac{460}{2240}$
60 Pounds	4 $\frac{1}{4}$ Inches	94 $\frac{640}{2240}$
65 Pounds	4 $\frac{7}{16}$ Inches	102 $\frac{320}{2240}$
70 Pounds	4 $\frac{5}{8}$ Inches	110
75 Pounds	4 $\frac{13}{16}$ Inches	117 $\frac{710}{2240}$
80 Pounds	5 Inches	125 $\frac{1600}{2240}$
85 Pounds	5 $\frac{3}{16}$ Inches	133 $\frac{1280}{2240}$
90 Pounds	5 $\frac{3}{8}$ Inches	141 $\frac{960}{2240}$
95 Pounds	5 $\frac{9}{16}$ Inches	149 $\frac{271}{2240}$
100 Pounds	5 $\frac{3}{4}$ Inches	157 $\frac{300}{2240}$

WRITE FOR PRICES.

ESTIMATED WEIGHTS—Continued.

STEEL BANDS.

Approximate weight per lineal foot, in pounds. Birmingham or Stubbs' Gauge.

Gauge No.	1	2	3	4	5	6	7	8	9	10	11	12
Width of Band												
$\frac{3}{8}$	3825	3621	3302	3035	2805	2588	2295	2104	1887	1709	1530	1390
$\frac{7}{16}$	4463	4225	3852	3540	3273	3020	2678	2424	2202	1993	1785	1621
$\frac{1}{2}$	5100	4828	4403	4046	3740	3451	3060	2805	2516	2278	2040	1853
$\frac{9}{16}$	5738	5432	4953	4552	4208	3882	3443	3156	2831	2563	2295	2085
$\frac{5}{8}$	6375	6035	5503	5058	4675	4314	3825	3506	3145	2848	2550	2316
$\frac{3}{4}$	7650	7242	6604	6069	5610	5177	4590	4208	3774	3417	3060	2780
$\frac{7}{8}$	8925	8449	7705	7081	6545	6039	5355	4909	4403	3987	3570	3243
1	1.0200	.9656	.8806	.8092	.7480	.6902	.6120	.5610	.5032	.4556	.4080	.3706
$1\frac{1}{8}$	1.1475	1.0863	.9907	.9104	.8416	.7765	.6885	.6311	.5661	.5126	.4590	.4169
$1\frac{1}{4}$	1.2750	1.2070	1.1008	1.0115	.9350	.8628	.7650	.7013	.6290	.5695	.5100	.4638
$1\frac{3}{8}$	1.4025	1.3277	1.2108	1.1127	1.0285	.9490	.8415	.7714	.6919	.6265	.5610	.5096
$1\frac{1}{2}$	1.5300	1.4484	1.3209	1.2138	1.1220	1.0353	.9180	.8415	.7548	.6834	.6120	.5559
$1\frac{3}{4}$	1.7850	1.6898	1.5411	1.4161	1.3090	1.2079	1.0710	.9818	.8806	.7973	.7140	.6486
2	2.0400	1.9312	1.7612	1.6184	1.4960	1.3804	1.2240	1.1220	1.0064	.9112	.8160	.7412
$2\frac{1}{4}$	2.2950	2.1726	1.9814	1.8207	1.6830	1.5530	1.3770	1.2623	1.1322	1.0251	.9180	.8339
$2\frac{1}{2}$	2.5500	2.4140	2.2015	2.0230	1.8700	1.7255	1.5300	1.4025	1.2580	1.1390	1.0200	.9265
$2\frac{3}{4}$	2.8050	2.6554	2.4217	2.2253	2.0570	1.8981	1.6830	1.5428	1.3838	1.2529	1.1220	1.0192
3	3.0600	2.8968	2.6418	2.4276	2.2440	2.0706	1.8360	1.6830	1.5096	1.3668	1.2240	1.1118
$3\frac{1}{2}$	3.5700	3.3796	3.0821	2.8322	2.6180	2.4157	2.1420	1.9635	1.7612	1.5946	1.4280	1.2971
4	4.0800	3.8624	3.5224	3.2368	2.9920	2.7608	2.4480	2.2440	2.0128	1.8224	1.6320	1.4824
$4\frac{1}{2}$	4.5900	4.3452	3.9627	3.6414	3.3660	3.1059	2.7540	2.5245	2.2644	2.0502	1.8360	1.6667
5	5.1000	4.8280	4.4030	4.0460	3.7400	3.4519	3.0600	2.8050	2.5160	2.2780	2.0400	1.8530
$5\frac{1}{2}$	5.6100	5.3108	4.8433	4.4506	4.1140	3.7962	3.3660	3.0855	2.7676	2.5058	2.2440	2.0383
6	6.1200	5.7936	5.2836	4.8552	4.4880	4.1412	3.6720	3.3660	3.0192	2.7336	2.4480	2.2236

ESTIMATED WEIGHTS—Continued.

STEEL HOOPS.

Approximate weight, per lineal foot, in pounds. Birmingham or Stubbs' Gauge.

Gauge No.	13	14	15	16	17	18	19	20	21	22	23	24
Width of Band.												
$\frac{3}{8}$	.1211	.1058	.0918	.0829	.0740	.0625	.0536	.0446	.0408	.0357	.0319	.0281
$\frac{7}{16}$	.1413	.1235	.1071	.0967	.0863	.0729	.0625	.0521	.0476	.0417	.0372	.0327
$\frac{1}{2}$	.1615	.1411	.1224	.1105	.0986	.0833	.0714	.0595	.0545	.0476	.0425	.0374
$\frac{5}{8}$	.1817	.1587	.1377	.1243	.1109	.0937	.0803	.0669	.0612	.0536	.0478	.0421
$\frac{3}{4}$	.2019	.1764	.1530	.1381	.1233	.1041	.0893	.0744	.0680	.0595	.0531	.0468
$\frac{7}{8}$	.2221	.1940	.1683	.1519	.1356	.1145	.0982	.0818	.0748	.0655	.0584	.0514
1	.2423	.2117	.1836	.1658	.1479	.1250	.1071	.0893	.0816	.0714	.0638	.0561
$1\frac{1}{8}$	.2826	.2469	.2142	.1934	.1726	.1458	.1250	.1041	.0952	.0833	.0744	.0655
$1\frac{1}{4}$	.3230	.2822	.2448	.2210	.1972	.1666	.1428	.1190	.1088	.0952	.0850	.0748
$1\frac{3}{8}$	.3634	.3175	.2754	.2486	.2219	.1874	.1607	.1339	.1224	.1071	.0956	.0842
$1\frac{1}{2}$	.4038	.3528	.3060	.2763	.2465	.2083	.1785	.1488	.1360	.1190	.1063	.0935
$1\frac{3}{4}$	.4441	.3880	.3366	.3039	.2712	.2291	.1964	.1636	.1496	.1309	.1169	.1029
2	.4845	.4233	.3672	.3315	.2958	.2499	.2142	.1785	.1632	.1428	.1275	.1122
$2\frac{1}{4}$	.5653	.4939	.4284	.3868	.3451	.2916	.2499	.2083	.1904	.1666	.1488	.1309
$2\frac{1}{2}$	.6460	.5644	.4896	.4420	.3944	.3332	.2856	.2380	.2176	.1904	.1700	.1496
$2\frac{3}{4}$	.7268	.6350	.5508	.4973	.4437	.3749	.3213	.2678	.2448	.2142	.1913	.1683
3	.8075	.7055	.6120	.5525	.4930	.4165	.3570	.2975	.2720	.2380	.2125	.1870
$3\frac{1}{2}$	.8883	.7761	.6732	.6078	.5423	.4582	.3927	.3273	.2992	.2618	.2338	.2057
	.9690	.8466	.7344	.6630	.5916	.4998	.4284	.3570	.3264	.2856	.2550	.2244
	1.1305	.9877	.8568	.7735	.6902	.5831	.4998	.4165	.3808	.3332	.2975	.2618

WEIGHTS OF ROUND AND SQUARE IRON.

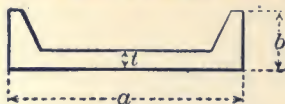
Estimated weight per lineal foot.

Size In Inches	Estimated Weight in Lbs.	Estimated Weight in Lbs.	Size in Inches.	Estimated Weight in Lbs.	Estimated Weight in Lbs.
$\frac{3}{16}$	.0930	.1184	$2\frac{1}{8}$	11.95	15.21
$\frac{1}{4}$	.1653	.2105	$2\frac{1}{4}$	13.39	17.05
$\frac{5}{16}$	.2583	.3290	$2\frac{3}{8}$	14.92	19.00
$\frac{3}{8}$	.3720	.4736	$2\frac{1}{2}$	16.53	21.05
$\frac{7}{16}$	.5063	.6446	$2\frac{5}{8}$	18.23	23.21
$\frac{1}{2}$	.6613	.8420	$2\frac{3}{4}$	20.01	25.47
$\frac{9}{16}$	.8370	1.066	3	23.81	30.31
$\frac{5}{8}$	1.033	1.316	$3\frac{1}{4}$	27.94	35.57
$\frac{3}{4}$	1.488	1.895	$3\frac{1}{2}$	32.41	41.26
$\frac{7}{8}$	2.025	2.579	$3\frac{3}{4}$	37.20	47.37
1	2.645	3.368	4	42.33	53.89
$1\frac{1}{8}$	3.348	4.263	$4\frac{1}{2}$	53.57	.....
$1\frac{1}{4}$	4.133	5.263	5	66.13	.....
$1\frac{3}{8}$	5.001	6.368	$5\frac{1}{2}$	80.02	.....
$1\frac{1}{2}$	5.952	7.578	6	95.23	.....
$1\frac{5}{8}$	6.985	8.893	$6\frac{1}{2}$	111.8	.....
$1\frac{3}{4}$	8.101	10.31	7	129.6	.....
$1\frac{7}{8}$	9.300	11.84	8	169.3	.....
2	10.58	13.47			

ESTIMATED WEIGHTS OF FLAT IRON.

Per lineal foot in pounds.

Width in Inches.	Thickness in Inches.											
	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1	.21	.42	.63	.84	1.05	1.26	1.47	1.68	2.11	2.53	.....	.....
$1\frac{1}{16}$	.24	.47	.71	.95	1.18	1.42	1.66	1.90	2.37	2.84	.....	.....
$1\frac{1}{8}$	.26	.53	.79	1.05	1.32	1.58	1.84	2.11	2.63	3.16	3.68	4.21
$1\frac{1}{4}$	.29	.58	.87	1.16	1.45	1.74	2.03	2.32	2.89	3.47	4.05	4.63
$1\frac{1}{8}$	.32	.63	.95	1.26	1.58	1.90	2.21	2.53	3.16	3.79	4.42	5.05
$1\frac{3}{8}$	.34	.68	1.03	1.37	1.71	2.05	2.39	2.74	3.42	4.11	4.79	5.47
$1\frac{1}{2}$	.37	.74	1.11	1.47	1.84	2.21	2.58	2.95	3.68	4.42	5.16	5.89
2	.42	.84	1.26	1.68	2.11	2.53	2.95	3.37	4.21	5.05	5.89	6.74
$2\frac{1}{8}$	.47	.95	1.42	1.90	2.37	2.84	3.32	3.79	4.74	5.68	6.63	7.58
$2\frac{1}{4}$	.53	1.05	1.58	2.11	2.63	3.16	3.68	4.21	5.26	6.32	7.37	8.42
$2\frac{3}{8}$	.58	1.16	1.74	2.32	2.89	3.47	4.05	4.63	5.79	6.95	8.10	9.26
3	.63	1.26	1.90	2.53	3.16	3.79	4.42	5.05	6.32	7.58	8.84	10.10
$3\frac{1}{8}$	.68	1.37	2.05	2.74	3.42	4.11	4.79	5.47	6.84	8.21	9.58	10.95
$3\frac{1}{4}$	.74	1.47	2.21	2.95	3.68	4.42	5.16	5.89	7.37	8.84	10.32	11.79
$3\frac{3}{8}$	.79	1.58	2.37	3.16	3.95	4.74	5.53	6.32	7.89	9.47	11.05	12.63
4	.84	1.68	2.53	3.37	4.21	5.05	5.89	6.74	8.42	10.10	11.79	13.47
$4\frac{1}{8}$	.95	1.90	2.84	3.79	4.74	5.68	6.63	7.58	9.47	11.38	13.26	15.16
5	1.05	2.11	3.16	4.21	5.26	6.32	7.37	8.42	10.53	12.63	14.74	16.84
$5\frac{1}{8}$	1.16	2.32	3.47	4.63	5.79	6.95	8.10	9.26	11.58	13.89	16.21	18.52
6	1.26	2.53	3.79	5.05	6.32	7.58	8.84	10.10	12.63	15.16	17.68	20.21
7	1.47	2.94	4.42	5.90	7.36	8.84	10.32	11.79	14.74	17.68	20.64	23.58
8	1.68	3.36	5.05	6.74	8.42	10.10	11.78	13.48	16.84	20.20	23.58	26.94

LIGHT OR GROOVED CHANNELS.**DIMENSIONS AND ESTIMATED WEIGHTS.**

a Inches	b Inches	t Inches or Gauges	Weight per Foot Pounds	a Inches	b Inches	t Inches or Gauges	Weight per Foot Pounds
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	0.28	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{8}$	1.01
$\frac{1}{2}$	$\frac{15}{64}$	No. 14	0.23	$1\frac{1}{4}$	$\frac{9}{16}$	$\frac{3}{16}$	1.28
$\frac{1}{2}$	$\frac{15}{64}$ Full	No. 13	0.25	$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{1}{4}$	1.54
$\frac{1}{2}$	$\frac{1}{4}$ Full	No. 12	0.27	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{16}$	1.18
$\frac{5}{8}$	$\frac{19}{64}$ Full	No. 14	0.33	$1\frac{1}{4}$	$\frac{9}{16}$	$\frac{1}{4}$	1.44
$\frac{5}{8}$	$\frac{5}{16}$	No. 13	0.35	$1\frac{3}{8}$	$\frac{23}{64}$	$\frac{1}{8}$	0.89
$\frac{5}{8}$	$\frac{19}{64}$ Scant	No. 12	0.38	$1\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	0.90
$\frac{5}{8}$	$\frac{5}{16}$	No. 10	0.42	$1\frac{3}{8}$	$\frac{7}{16}$	$\frac{3}{16}$	1.20
$\frac{3}{4}$	$\frac{5}{16}$	$\frac{7}{64}$	0.47	$1\frac{3}{8}$	$\frac{7}{16}$	$\frac{3}{16}$	1.20
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{7}{64}$	0.53	$1\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{4}$	1.49
$\frac{7}{8}$	$\frac{1}{4}$	$\frac{7}{64}$	0.47	$1\frac{1}{2}$	$\frac{7}{16}$	$\frac{3}{16}$	1.21
$\frac{7}{8}$	$\frac{11}{32}$	$\frac{7}{64}$	0.59	$1\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	1.53
$\frac{7}{8}$	$\frac{23}{64}$	$\frac{7}{64}$	0.60	$1\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{8}$	1.12
$\frac{7}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	0.65	$1\frac{1}{2}$	$\frac{9}{16}$	$\frac{3}{16}$	1.43
$\frac{7}{8}$	$\frac{7}{16}$	$\frac{3}{16}$	0.84	$1\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{16}$	1.35
$\frac{7}{8}$	$\frac{7}{16}$	$\frac{1}{8}$	0.70	$1\frac{1}{2}$	$\frac{9}{16}$	$\frac{1}{4}$	1.67
$\frac{7}{8}$	$\frac{7}{16}$	$\frac{1}{8}$	0.72	$1\frac{3}{4}$	$\frac{7}{16}$	$\frac{3}{16}$	1.43
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{16}$	0.91	$1\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	1.81
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	0.80	$1\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{16}$	1.55
$\frac{7}{8}$	$\frac{9}{16}$	$\frac{1}{4}$	1.08	$1\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	1.86
1	$\frac{3}{8}$	$\frac{1}{8}$	0.68	$1\frac{3}{4}$	$\frac{9}{16}$	$\frac{5}{16}$	2.23
1	$\frac{7}{16}$	$\frac{3}{16}$	0.89	2	$\frac{1}{2}$	$\frac{1}{8}$	1.49
1	$\frac{1}{2}$	$\frac{1}{4}$	1.10	2	$\frac{9}{16}$	$\frac{3}{16}$	1.91
1	$\frac{3}{8}$	$\frac{1}{8}$	0.69	2	$\frac{5}{8}$	$\frac{1}{4}$	2.34
1	$\frac{7}{16}$	$\frac{3}{16}$	0.90	2	$\frac{9}{16}$	$\frac{3}{16}$	1.75
1	$\frac{3}{8}$	$\frac{1}{8}$	0.76	2	$\frac{5}{8}$	$\frac{1}{4}$	2.32
1	$\frac{1}{2}$	$\frac{1}{8}$	0.82	2	$\frac{1}{2}$	$\frac{1}{8}$	1.40
1	$\frac{9}{16}$	$\frac{3}{16}$	1.04	2	$\frac{9}{16}$	$\frac{3}{16}$	1.83
1	$\frac{21}{64}$	No. 12	0.74	2	$\frac{5}{8}$	$\frac{1}{4}$	2.25
$1\frac{1}{8}$	$\frac{7}{16}$	$\frac{3}{16}$	1.05	$2\frac{1}{8}$	$\frac{7}{16}$	$\frac{5}{32}$	1.50
$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	0.92	$2\frac{1}{2}$	$\frac{15}{32}$	$\frac{1}{8}$	1.50
$1\frac{1}{8}$	$\frac{9}{16}$	$\frac{3}{16}$	1.16	$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{32}$	1.77
$1\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{8}$	0.85	$2\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{16}$	2.27
$1\frac{1}{4}$	$\frac{7}{16}$	$\frac{3}{16}$	1.12	$2\frac{1}{2}$	$\frac{11}{16}$	$\frac{1}{4}$	2.80
$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	1.38	$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{16}$	3.33
$1\frac{1}{4}$	$\frac{7}{16}$	$\frac{3}{16}$	1.10	$2\frac{1}{2}$	$\frac{15}{16}$	$\frac{3}{8}$	3.86
$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	1.37				

WEIGHTS AND DIMENSIONS.

Standard Steel Tees with Equal Legs.

Standard Steel Tees with Unequal Legs.

Size, inches		Thickness of Metal Inches		Esti- mated Weight per Foot Pounds	Size, inches		Thickness of Metal Inches		Esti- mated Weight per Foot Pounds
Flange	Stem	Flange	Stem		Flange	Stem	Flange	Stem	
4	4	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	13.9	5	3	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{5}{8}$	13.6
4	4	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	10.9	5	$2\frac{1}{2}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{1}{2}$ to $\frac{3}{4}$	11.0
$3\frac{1}{2}$	$3\frac{1}{2}$	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	11.9	$4\frac{1}{2}$	$3\frac{1}{2}$	$\frac{7}{16}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{7}{8}$	15.9
$3\frac{1}{2}$	$3\frac{1}{2}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	9.3	$4\frac{1}{2}$	3	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	8.6
3	3	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	10.1	$4\frac{1}{2}$	3	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	10.0
3	3	$\frac{7}{16}$ to $\frac{1}{2}$	$\frac{7}{16}$ to $\frac{1}{2}$	9.0	$4\frac{1}{2}$	$2\frac{1}{2}$	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	8.0
3	3	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	7.9	$4\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	9.3
3	3	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	6.8	4	5	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	15.7
$2\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	6.5	4	5	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	12.3
$2\frac{1}{2}$	$2\frac{1}{2}$	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	5.6	4	$4\frac{1}{2}$	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	14.8
$2\frac{1}{4}$	$2\frac{1}{4}$	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	5.0	4	$4\frac{1}{2}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	11.6
$2\frac{1}{4}$	$2\frac{1}{4}$	$\frac{1}{4}$ to $\frac{5}{16}$	$\frac{1}{4}$ to $\frac{5}{16}$	4.2	4	3	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	9.3
2	2	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	4.4	4	$2\frac{1}{2}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	8.7
2	2	$\frac{1}{4}$ to $\frac{5}{16}$	$\frac{1}{4}$ to $\frac{5}{16}$	3.7	4	$2\frac{1}{2}$	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	7.4
$1\frac{3}{4}$	$1\frac{3}{4}$	$\frac{1}{4}$ to $\frac{5}{16}$	$\frac{1}{4}$ to $\frac{5}{16}$	3.2	4	2	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	7.9
$1\frac{3}{4}$	$1\frac{3}{4}$	$\frac{3}{16}$ to $\frac{1}{2}$	$\frac{3}{16}$ to $\frac{1}{2}$	2.1	4	2	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	6.7
$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{1}{4}$ to $\frac{9}{32}$	$\frac{1}{4}$ to $\frac{9}{32}$	2.6	$3\frac{1}{2}$	4	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	12.8
$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{16}$ to $\frac{7}{32}$	$\frac{3}{16}$ to $\frac{7}{32}$	2.0	$3\frac{1}{2}$	4	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	10.0
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{4}$ to $\frac{9}{32}$	$\frac{1}{4}$ to $\frac{9}{32}$	2.1	$3\frac{1}{2}$	3	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	11.0
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{3}{16}$ to $\frac{7}{32}$	$\frac{3}{16}$ to $\frac{7}{32}$	1.7	$3\frac{1}{2}$	3	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	8.7
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{8}$	$\frac{1}{8}$ to $\frac{1}{8}$	1.0	$3\frac{1}{2}$	3	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	7.7
$1\frac{1}{8}$	$1\frac{1}{8}$	$\frac{3}{16}$ to $\frac{1}{8}$	$\frac{3}{16}$ to $\frac{1}{8}$	1.3	3	4	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	11.9
$1\frac{1}{8}$	$1\frac{1}{8}$	$\frac{1}{8}$ to $\frac{1}{8}$	$\frac{1}{8}$ to $\frac{1}{8}$	1.0	3	4	$\frac{1}{2}$ to $\frac{7}{16}$	$\frac{1}{2}$ to $\frac{7}{16}$	10.6
1	1	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{1}{4}$ to $\frac{1}{4}$	1.5	3	4	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	9.3
1	1	$\frac{3}{16}$ to $\frac{7}{32}$	$\frac{3}{16}$ to $\frac{7}{32}$	1.3	3	$3\frac{1}{2}$	$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{1}{2}$ to $\frac{9}{16}$	11.0
1	1	$\frac{1}{8}$ to $\frac{5}{32}$	$\frac{1}{8}$ to $\frac{5}{32}$	1.0	3	$3\frac{1}{2}$	$\frac{7}{16}$ to $\frac{1}{2}$	$\frac{7}{16}$ to $\frac{1}{2}$	9.8
$\frac{7}{8}$	$\frac{7}{8}$	$\frac{1}{8}$ to $\frac{1}{8}$	$\frac{1}{8}$ to $\frac{1}{8}$	0.7	3	$3\frac{1}{2}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	8.6
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{8}$ to $\frac{1}{8}$	$\frac{1}{8}$ to $\frac{1}{8}$	0.6	3	$2\frac{1}{2}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	7.2
$\frac{5}{8}$	$\frac{5}{8}$	$\frac{1}{8}$ to $\frac{1}{8}$	$\frac{1}{8}$ to $\frac{1}{8}$	0.5	3	$2\frac{1}{2}$	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	6.2
					$2\frac{3}{4}$	2	$\frac{5}{16}$ to $\frac{11}{32}$	$\frac{3}{4}$ to $\frac{7}{8}$	7.4
					$2\frac{1}{2}$	3	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	7.2
					$2\frac{1}{2}$	3	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	6.2
					$2\frac{1}{2}$	$2\frac{3}{4}$	$\frac{3}{8}$ to $\frac{7}{16}$	$\frac{3}{8}$ to $\frac{7}{16}$	6.8
					$2\frac{1}{2}$	$2\frac{3}{4}$	$\frac{5}{16}$ to $\frac{3}{8}$	$\frac{5}{16}$ to $\frac{3}{8}$	5.9
					$2\frac{1}{2}$	$1\frac{3}{32}$	$\frac{1}{4}$ to $\frac{17}{64}$	$\frac{1}{4}$ to $\frac{17}{64}$	3.6
					$2\frac{1}{2}$	$1\frac{3}{32}$	$\frac{3}{16}$ to $\frac{7}{32}$	$\frac{3}{16}$ to $\frac{7}{32}$	2.9
					$2\frac{1}{2}$	$1\frac{1}{4}$	$\frac{1}{16}$ to $\frac{3}{32}$	$\frac{1}{16}$ to $\frac{3}{32}$	3.0
					2	$1\frac{1}{2}$	$\frac{1}{4}$ to $\frac{5}{16}$	$\frac{1}{4}$ to $\frac{5}{16}$	3.2
					$1\frac{1}{2}$	$\frac{7}{8}$	$\frac{3}{32}$ to $\frac{7}{64}$	$\frac{3}{32}$ to $\frac{7}{64}$	0.9
					$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{7}{64}$ to $\frac{9}{64}$	$\frac{7}{64}$ to $\frac{9}{64}$	0.7

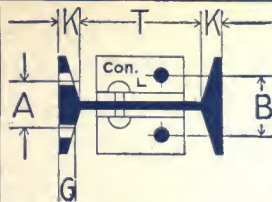
Estimated weight per lineal foot in pounds.

Size in Inches.	Thickness in Inches.															
	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	1	
8 x 8	...	...	...	...	...	...	...	26.4	29.6	32.7	35.8	38.9	42.0	45.0	51.0
7 x 3½	...	...	...	...	...	...	15.0	17.0	19.1	21.0	23.0	24.9	26.8	28.7	32.3
6 x 6	...	...	...	...	...	14.9	17.2	19.6	21.9	24.2	26.5	28.7	31.0	33.1	37.4
6 x 4	...	...	...	...	...	12.3	14.3	16.2	18.1	20.0	21.8	23.6	25.4	27.2	30.6
6 x 3½	...	...	...	...	...	11.7	13.5	15.3	17.1	18.9	20.6	22.4	24.0	25.7	28.9
5 x 5	...	...	...	...	...	12.3	14.3	16.2	18.1	20.0	21.8	23.6	25.4	27.2	30.6
5 x 4	...	...	...	...	...	11.0	12.8	14.5	16.2	17.8	19.5	21.1	22.7	24.2	...
5 x 3½	...	...	...	...	8.7	10.4	12.0	13.6	15.2	16.8	18.3	19.8	21.3	22.7	...
5 x 3	...	...	...	...	8.2	9.8	11.3	12.8	14.3	15.7	17.1	18.5	19.9	...	...
4½ x 3	...	...	...	...	7.7	9.1	10.6	11.9	13.3	14.7	16.0	17.3	18.5	...	...
4 x 4	...	5.2	...	6.6	8.2	9.8	11.3	12.8	14.3	15.7	17.1	18.5	19.9	...	...
4 x 3½	...	...	...	...	7.7	9.1	10.6	11.9	13.3	14.7	16.0	17.3	18.5	...	...
4 x 3	...	...	...	...	7.2	8.5	9.8	11.1	12.4	13.6	14.8	16.0	17.1	...	...
3¾ x 2½	...	...	...	...	6.4	7.7	8.8	10.0	11.1	12.2	13.3	14.3	...	...	...
3½ x 3½	...	...	...	5.7	7.2	8.5	9.8	11.1	12.4	13.6	14.8	16.0	17.1	...	...
3½ x 3	...	...	...	...	6.6	7.9	9.1	10.2	11.4	12.5	13.6	14.7	15.8	...	...
3½ x 2½	...	...	...	4.9	6.1	7.2	8.3	9.4	10.4	11.5	12.5	...	...	...	...
3¼ x 3¼	...	...	...	4.9	6.1	7.8	9.0	10.2	11.4	12.5	13.6	14.7	...	...	...
3¼ x 2	...	...	...	4.3	5.3	6.3	7.2	8.1	9.0	...	...	...	...	...	...
3 x 3	2.5	3.7	...	4.9	6.1	7.2	8.3	9.4	10.4	11.5	12.4	13.4	14.4	...	...
3 x 2½	...	3.4	...	4.5	5.6	6.6	7.6	8.5	9.5	...	...	...	...	...	...
3 x 2	...	3.1	3.6	4.1	5.0	5.9	6.8	7.7	...	...	...	...	...	...	...
2¾ x 2¾	2.3	3.4	...	4.5	5.6	6.6	7.6	8.5	...	...	...	...	...	...	...
2½ x 2½	2.1	3.1	3.6	4.1	5.0	5.9	6.8	7.7	8.5	9.3	10.1	...	...	...	...
2½ x 2	...	2.8	...	3.7	4.5	5.3	6.1	6.8	...	...	...	...	...	...	...
2½ x 1¾	...	2.6	...	3.4	...	...	...	...	...	...	...	...	...	...	...
2½ x 1½	...	2.4	...	3.2	3.9	4.6	5.3	6.0	...	...	...	...	...	...	...
2¼ x 2¼	1.9	2.8	...	3.7	4.5	5.3	6.1	6.8	...	...	...	...	...	...	...
2¼ x 1½	...	2.3	...	3.0	3.7	4.4	5.0	5.6	...	...	...	...	...	...	...
2 x 2	1.7	2.5	...	3.2	4.0	4.7	5.3	...	...	...	...	...	...	...	...
2 x 1½	...	2.2	...	2.8	3.4	4.0	...	...	...	...	...	...	...	...	...
2 x 1¾	...	2.1	...	2.7	3.3	3.8	...	...	...	...	...	...	...	...	...
1¾ x 1¾	1.4	2.2	...	2.8	3.4	4.0	4.6	...	...	...	...	...	...	...	...
1¾ x 1½	...	2.0	...	2.6	3.3	3.9	...	...	...	...	...	...	...	...	...
1½ x 1½	1.3	1.8	...	2.4	2.9	3.4	...	...	...	...	...	...	...	...	...
1½ x 1	1.0	...	1.6	...	...	...	...	...	...	...	...	...	...	...	...
1¾ x ¾	0.9	1.3	...	1.9	...	...	...	...	...	...	...	...	...	...	...
1¼ x 1¼	...	1.1	1.5	...	2.0	2.4	...	...	...	...	...	...	...	...	...
1¾ x 1¾	0.9	1.3	...	1.7	2.1	...	...	...	...	...	...	...	...	...	...
1 x 1	0.8	1.2	...	1.5	...	...	...	...	...	...	...	...	...	...	...
1 x ¾	0.7	1.0	...	...	...	...	...	...	...	...	...	...	...	...	...
1 x ¾	0.6	0.9	...	...	...	...	...	...	...	...	...	...	...	...	...
¾ x ¾	0.7	1.0	...	...	...	...	...	...	...	...	...	...	...	...	...
¾ x ¾	0.6	0.9	...	...	...	...	...	...	...	...	...	...	...	...	...
¾ x ¾	0.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
½ x ½	0.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...

STANDARD STEEL "I" BEAMS.

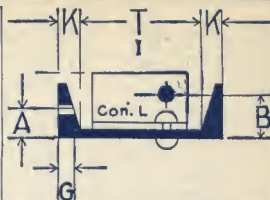
Estimated Weights and Dimensions.

Size.	W'ght per Foot.	Width Flange.	Tk. Web	Area Sec- tion.	Max'm Rivet Grip.	Punch Gauge Inches.		Connections.	
	In.	Lbs.	Inc.	hes.	Sq.in.	Dia.	G	A	B
3	5.5	2.33	.17	1.63	$\frac{3}{8}$	$\frac{1}{4}$	1 $\frac{7}{8}$	5 $\frac{3}{8}$	5 $\frac{3}{8}$
	6.5	2.42	.26	1.91				5 $\frac{1}{4}$	5 $\frac{1}{4}$
	7.5	2.52	.36	2.21				5 $\frac{1}{8}$	5 $\frac{1}{8}$
4	7.5	2.66	.19	2.21	$\frac{1}{2}$	$\frac{9}{8}$	1 $\frac{1}{2}$	5 $\frac{3}{8}$	5 $\frac{3}{8}$
	8.5	2.73	.26	2.50				5 $\frac{1}{4}$	5 $\frac{1}{4}$
	9.5	2.81	.34	2.79				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	10.5	2.88	.41	3.09				5 $\frac{7}{8}$	5 $\frac{7}{8}$
5	9.75	3.00	.21	2.87				1 $\frac{3}{4}$	1 $\frac{3}{4}$
	12.25	3.15	.36	3.60				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	14.75	3.29	.50	4.34				5 $\frac{1}{2}$	5 $\frac{1}{2}$
6	12.25	3.33	.23	3.61	$\frac{5}{8}$	$\frac{1}{2}$	2	5 $\frac{1}{4}$	5 $\frac{1}{4}$
	14.75	3.45	.35	4.34				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	17.25	3.57	.47	5.07				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	15.00	3.66	.25	4.42				5 $\frac{1}{4}$	5 $\frac{1}{4}$
7	17.50	3.76	.35	5.15	$\frac{3}{8}$	$\frac{1}{4}$	2 $\frac{1}{4}$	5 $\frac{3}{8}$	5 $\frac{3}{8}$
	20.00	3.87	.46	5.88				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	18.00	4.00	.27	5.33	$\frac{3}{4}$	$\frac{1}{2}$	2 $\frac{1}{4}$	5 $\frac{3}{8}$	5 $\frac{3}{8}$
8	20.50	4.08	.35	5.96				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	23.00	4.17	.44	6.69				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	25.50	4.26	.53	7.43				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	21.00	4.33	.29	6.31				5 $\frac{3}{8}$	5 $\frac{3}{8}$
9	25.00	4.45	.41	7.35				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	30.00	4.61	.57	8.82				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	35.00	4.77	.73	10.29				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	25.00	4.66	.31	7.37				5 $\frac{3}{8}$	5 $\frac{3}{8}$
10	30.00	4.80	.45	8.82				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	35.00	4.95	.60	10.29				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	40.00	5.10	.75	11.76				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	31.50	5.00	.35	9.26				5 $\frac{3}{8}$	5 $\frac{3}{8}$
12	35.00	5.09	.44	10.29				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	40.00	5.21	.56	11.76				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	42.00	5.50	.41	12.48				5 $\frac{1}{2}$	5 $\frac{1}{2}$
15	45.00	5.55	.46	13.24				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	50.00	5.65	.56	14.71				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	55.00	5.75	.66	16.18				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	60.00	6.00	.59	17.65				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	55.00	6.00	.46	15.93				5 $\frac{3}{8}$	5 $\frac{3}{8}$
18	60.00	6.10	.56	17.65				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	65.00	6.18	.64	19.12				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	70.00	6.26	.72	20.59				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	65.00	6.25	.50	19.08				5 $\frac{3}{8}$	5 $\frac{3}{8}$
20	70.00	6.33	.58	20.59				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	75.00	6.40	.65	22.06				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	80.00	7.00	.50	23.32				5 $\frac{1}{2}$	5 $\frac{1}{2}$
24	85.00	7.07	.57	25.00				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	90.00	7.13	.63	26.47				5 $\frac{1}{2}$	5 $\frac{1}{2}$
	95.00	7.19	.69	27.94				5 $\frac{3}{8}$	5 $\frac{3}{8}$
	100.00	7.25	.75	29.41				5 $\frac{1}{2}$	5 $\frac{1}{2}$
								5 $\frac{3}{8}$	5 $\frac{3}{8}$



STANDARD STEEL CHANNELS.

Estimated Weights and Dimensions.



Size.	W'ght per Foot.	Width Flange.	Tk. Web	Area Sec- tion.	Max'm Rivet Grip.	Punch Gauge Inches.					
In.	Lbs.	Inc	hes	Sq.in.	Dia.	G	A	B	K	T	Connection L's.
3	4.00	1.410	.170	1.19	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$2\frac{1}{8}$	$\frac{5}{8}$	$1\frac{1}{4}$	2-6x4x7/16x0'2'' Wt. 7lb.
	5.00	1.504	.264	1.47			$2\frac{3}{4}$	$2\frac{3}{8}$			
	6.00	1.602	.362	1.76			$2\frac{7}{8}$	$2\frac{1}{2}$			
4	5.25	1.58	.180	1.55	$\frac{1}{2}$	$\frac{3}{8}$	1	$2\frac{1}{8}$		$2\frac{3}{4}$	2-6x4x7/16x0'2'' Wt. 7lb.
	6.25	1.652	.252	1.84			$2\frac{3}{4}$	$2\frac{1}{8}$			
	7.25	1.725	.325	2.13			$2\frac{1}{2}$	$2\frac{1}{8}$			
5	6.50	1.75	.190	1.95		$\frac{5}{16}$	1	$2\frac{1}{8}$		$3\frac{3}{4}$	2-6x4x7/16x0'2 $\frac{1}{2}$ '' Wt. 8lb.
	9.00	1.89	.33	2.65			$1\frac{1}{4}$	$2\frac{1}{8}$			
	11.50	2.037	.477	3.38			3	$2\frac{1}{8}$			
6	8.00	1.92	.200	2.38	$\frac{5}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$	$2\frac{1}{8}$	$\frac{3}{4}$	$4\frac{1}{2}$	2-6x4x7/16x0'3'' Wt. 9lb.
	10.50	2.038	.318	3.09			$2\frac{1}{8}$	$2\frac{1}{8}$			
	13.00	2.16	.440	3.82			$1\frac{3}{8}$	$2\frac{1}{8}$			
	15.50	2.288	.563	4.56			$3\frac{1}{8}$	$2\frac{1}{8}$			
7	9.75	2.09	.210	2.85		$\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{1}{8}$		$5\frac{1}{2}$	2-6x4x7/16x0'5'' Wt. 16lb.
	12.25	2.198	.318	3.60			$2\frac{1}{8}$	$2\frac{1}{8}$			
	14.75	2.303	.423	4.34			$2\frac{3}{8}$	$2\frac{1}{8}$			
	17.25	2.408	.528	5.07		$\frac{3}{8}$	$1\frac{1}{2}$	3			
	19.75	2.513	.633	5.81			$3\frac{1}{8}$	$3\frac{1}{8}$			
8	11.25	2.26	.220	3.35	$\frac{3}{4}$	$\frac{3}{8}$	$1\frac{1}{4}$	$2\frac{3}{4}$	$\frac{7}{8}$	$6\frac{1}{4}$	2-6x4x7/16x0'5'' Wt. 16lb.
	13.75	2.347	.307	4.04			$2\frac{1}{8}$	$2\frac{1}{8}$			
	16.25	2.439	.399	4.78			$1\frac{1}{2}$	$2\frac{1}{8}$			
	18.75	2.530	.490	5.51			3	$2\frac{1}{8}$			
	21.25	2.622	.582	6.25			$3\frac{1}{8}$	$3\frac{1}{8}$			
9	13.25	2.43	.230	3.89		$\frac{1}{2}$	$1\frac{3}{8}$	$2\frac{3}{4}$		$7\frac{1}{4}$	2-6x4x7/16x0'5'' Wt. 16lb.
	15.00	2.488	.288	4.41			$2\frac{1}{8}$	$2\frac{1}{8}$			
	20.00	2.652	.452	5.88		$\frac{3}{8}$	$1\frac{3}{4}$	3			
	25.00	2.815	.615	7.35			$3\frac{1}{8}$	$3\frac{1}{8}$			
10	15.00	2.60	.240	4.46		$\frac{7}{16}$	$1\frac{1}{2}$	$2\frac{3}{4}$		$8\frac{1}{4}$	2-6x4x7/16x0'5'' Wt. 16lb.
	20.00	2.742	.382	5.88			$2\frac{1}{8}$	$2\frac{1}{8}$			
	25.00	2.889	.529	7.35		$\frac{3}{8}$	2	3			
	30.00	3.036	.676	8.82			$3\frac{3}{8}$	$3\frac{3}{8}$			
	35.00	3.183	.823	10.29			$3\frac{1}{8}$	$3\frac{1}{8}$			
12	20.50	2.940	.280	6.03		$\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	1''	10''	2-6x4x7/16x0'7 $\frac{1}{2}$ '' Wt. 23lb.
	25.00	3.05	.390	7.35			$2\frac{1}{8}$	$2\frac{1}{8}$			
	30.00	3.173	.513	8.82			2	3			
	35.00	3.296	.636	10.29			$3\frac{1}{8}$	$3\frac{1}{8}$			
	40.00	3.418	.758	11.76			$3\frac{1}{4}$	$3\frac{1}{4}$			
15	33.00	3.40	.400	9.90		$\frac{3}{4}$	$1\frac{7}{8}$	$2\frac{7}{8}$	$1\frac{3}{8}$	$12\frac{1}{4}$	2-6x4x7/16x0'10'' Wt. 31lb.
	35.00	3.426	.426	10.29			$2\frac{1}{8}$	$2\frac{1}{8}$			
	40.00	3.524	.524	11.76			3	3			
	45.00	3.622	.622	13.24		$\frac{5}{8}$	$2\frac{1}{4}$	$3\frac{1}{8}$			
	50.00	3.720	.720	14.71			$3\frac{1}{4}$	$3\frac{1}{4}$			
	55.00	3.818	.818	16.18			$3\frac{5}{8}$	$3\frac{5}{8}$			

Greatest Span in Feet for Standard Beam Connections.

Size	Wt.	Span	Size	Wt.	Span	Size	Wt.	Span	Size	Wt.	Span
3''	5.50	2.0	7''	15.	4.0	12''	31.5	9.	18''	55.	14.5
4''	7.50	3.0	8''	18.	5.5	12''	40.	11.5	20''	65.	18.
5''	9.75	4.0	9''	21.	7.0	15''	42.	11.	20''	80.	22.
6''	12.25	5.5	10''	25.	9.5	15''	60.	15.5	24''	80.	22.



SAFE LOADS IN POUNDS STANDARD "I" BEAMS.



Span	3 Inch.			4 Inch.				5 Inch.			6 Inch.		
	5½ lbs.	6½ lbs.	7½ lbs.	7½ lbs.	8½ lbs.	9½ lbs.	10½ lbs.	9½ lbs.	12½ lbs.	13½ lbs.	12½ lbs.	13½ lbs.	17½ lbs.
4 ft.	4410	4780	5180	7950	8470	9000	9520	12900	14520	16160	19370	21320	23280
5	3530	3830	4140	6360	6780	7200	7610	10320	11620	12930	15490	17050	18620
6	2940	3190	3450	5300	5650	6000	6350	8600	9680	10770	12910	14210	15520
7	2520	2730	2960	4540	4840	5140	5440	7370	8300	9230	11070	12180	13300
8	2210	2390	2590	3980	4240	4500	4760	6450	7260	8080	9680	10660	11640
9	1960	2130	2300	3530	3770	4000	4230	5730	6460	7180	8610	9470	10350
10	1770	1910	2070	3180	3390	3600	3810	5160	5810	6460	7750	8530	9310
11	1600	1740	1880	2890	3080	3270	3460	4690	5280	5880	7040	7750	8460
12	1470	1590	1730	2650	2820	3000	3170	4300	4840	5390	6460	7110	7760
13	1360	1470	1590	2450	2610	2770	2930	3970	4470	4970	5960	6560	7160
14	1260	1370	1480	2270	2420	2570	2720	3680	4150	4620	5530	6090	6650
15	1180	1280	1380	2120	2260	2400	2540	3440	3870	4310	5160	5680	6210
16	1100	1200	1290	1990	2120	2250	2380	3220	3630	4040	4840	5330	5820
17	1040	1130	1220	1870	1990	2120	2240	3030	3420	3800	4560	5020	5480
18	980	1060	1150	1770	1880	2000	2120	2870	3230	3590	4300	4740	5170
19	930	1010	1090	1670	1780	1890	2000	2720	3060	3400	4080	4490	4900
20	880	960	1040	1590	1690	1800	1900	2580	2900	3230	3870	4260	4660
21	840	910	990	1510	1610	1710	1810	2460	2770	3080	3690	4060	4430
22	.....	.....	.....	.....	.....	.....	.....	2340	2640	2940	3520	3880	4230
23	.....	.....	.....	.....	.....	.....	.....	2240	2530	2810	3370	3710	4050
24	.....	.....	.....	.....	.....	.....	.....	2150	2420	2690	3230	3550	3880
25	.....	.....	.....	.....	.....	.....	.....	2060	2320	2590	3100	3410	3720
26	.....	.....	.....	.....	.....	.....	.....	1980	2220	2490	2980	3280	3580
27	.....	.....	.....	.....	.....	.....	.....	1910	2150	2390	2870	3160	3450
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2770	3050	3330
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2670	2940	3210

STANDARD "I" BEAMS.

Span	7 Inch.			8 Inch.				9 Inch.			
	15 lbs.	17½ lbs.	20 lbs.	17½ lbs.	20½ lbs.	22½ lbs.	25½ lbs.	21 lbs.	25 lbs.	30 lbs.	35 lbs.
4 ft.	27600	29850	32140	37920	40130	42740	45360	.....	.....	.....	.....
5	22080	23880	25710	30330	32100	34190	36290	.....	.....	.....	.....
6	18400	19900	21430	25280	26750	28500	30240	.....	.....	.....	.....
7	15770	17060	18370	21670	22930	24420	25920	.....	.....	.....	.....
8	13800	14930	16070	18960	20060	21370	22680	25160	27240	30180	33120
9	12270	13270	14280	16850	17830	19000	20160	22370	24210	26830	29440
10	11040	11940	12860	15170	16050	17100	18140	20130	21790	24150	26500
11	10040	10860	11690	13790	14590	15540	16490	18300	19810	21950	24090
12	9200	9950	10710	12640	13380	14250	15120	16770	18160	20120	22080
13	8490	9190	9890	11670	12350	13150	13960	15480	16760	18570	20380
14	7890	8530	9180	10830	11470	12210	12960	14380	15570	17250	18930
15	7360	7960	8570	10110	10700	11400	12100	13420	14530	16100	17670
16	6900	7460	8030	9408	10030	10690	11340	12580	13620	15090	16560
17	6490	7020	7560	8920	9440	10060	10670	11840	12820	14200	15590
18	6130	6630	7140	8430	8920	9500	10080	11180	12110	13410	14720
19	5810	6280	6770	7980	8450	9000	9500	10590	11470	12710	13950
20	5520	5970	6430	7580	8030	8550	9070	10060	10900	12070	13250
21	5260	5690	6120	7220	7640	8140	8640	9590	10380	11500	12620
22	5020	5430	5840	6890	7300	7770	8250	9150	9910	10980	12050
23	4800	5190	5590	6590	6980	7430	7890	8750	9480	10500	11520
24	4600	4980	5360	6320	6690	7120	7560	8390	9080	10060	11040
25	4420	4780	5140	6070	6420	6840	7260	8050	8720	9660	10600
26	4250	4590	4940	5830	6170	6580	6980	7740	8380	9290	10190
27	4090	4420	4760	5620	5940	6330	6720	7460	8070	8940	9810
28	3940	4260	4590	5420	5720	6110	6480	7190	7780	8620	9460
29	3810	4120	4430	5230	5530	5900	6260	6940	7510	8330	9140
30	6710	7260	8050	8830
31	9460	7030	7790	8550

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SAFE LOADS IN POUNDS.

STANDARD "I" BEAMS.

1/4 TABLE

3/8 TABLE

Span	10 Inch.				12 Inch.			15 Inch.				
	25 lbs.	30 lbs.	35 lbs.	40 lbs.	31 1/2 lbs.	35 lbs.	40 lbs.	42 lbs.	45 lbs.	50 lbs.	55 lbs.	60 lbs.
10ft.	26050	28620	31240	33850	38370	40580	43720	62830	64830	68750	72670	76600
11	23680	26020	28400	30780	34880	36890	39740	57120	58940	62500	66070	69630
12	21710	23850	26030	28210	31970	33820	36430	52360	54030	57290	60560	63830
13	20040	22020	24030	26040	29510	31220	33630	48330	49870	52890	55900	58920
14	18610	20450	22310	24180	27400	28990	31230	44880	46310	49110	51910	54710
15	17360	19080	20830	22570	25580	27050	29140	41880	43220	45840	48450	51060
16	16280	17890	19520	21160	23980	25360	27320	39270	40520	42970	45420	47870
17	15320	16840	18380	19910	22570	23870	25720	36960	38140	40440	42750	45060
18	14470	15900	17350	18810	21310	22540	24290	34900	36020	38200	40370	42550
19	13710	15070	16440	17820	20190	21360	23010	33070	34120	36190	38250	40310
20	13020	14310	15620	16930	19180	20290	21860	31410	32420	34380	36340	38300
21	12400	13630	14880	16120	18270	19320	20820	29920	30870	32740	34610	36470
22	11840	13010	14200	15390	17440	18450	19870	28560	29470	31250	33030	34820
23	11320	12450	13580	14710	16680	17640	19010	27320	28190	29890	31600	33300
24	10850	11930	13020	14110	15990	16910	18220	26180	27010	28650	30280	31910
25	10420	11450	12500	13540	15350	16230	17490	25130	25930	27500	29070	30640
26	10020	11010	12020	13020	14760	15610	16810	24160	24940	26440	27950	29460
27	9650	10600	11570	12540	14210	15030	16190	23270	24010	25460	26920	28370
28	9300	10220	11160	12090	13700	14490	15610	22440	23150	24550	25960	27360
29	8980	9870	10770	11670	13230	13990	15070	21660	22360	23710	25060	26410
30	8680	9540	10410	11280	12790	13530	14570	20940	21610	22920	24220	25530
31	8400	9230	10080	10920	12380	13090	14100	20270	20910	22180	23440	24710
32	8140	8950	9760	10580	11990	12680	13660	19630	20260	21490	22710	23940
33	7890	8670	9470	10260	11630	12300	13250	19040	19650	20830	22020	23210
34	.....	.....	.....	.....	11280	11940	12860	18480	19070	20220	21370	22530
35	.....	.....	.....	.....	10960	11590	12490	17950	18520	19640	20760	21880
36	.....	.....	.....	.....	10660	11270	12140	17450	18010	19100	20190	21280

STANDARD "I" BEAMS.

Span	18 Inch.				20 Inch.			24 Inch.				
	55 lbs.	60 lbs.	65 lbs.	70 lbs.	65 lbs.	70 lbs.	75 lbs.	80 lbs.	85 lbs.	90 lbs.	95 lbs.	100 lbs.
10ft.	94290	99770	104470	109180	124750	130110	135340	185530	192700	198970	205240	211205
11	85720	90700	94980	99250	113410	118280	123040	168660	175180	180880	186590	192290
12	78570	83140	87060	90980	103960	108430	112780	154610	160580	165810	171040	176270
13	72530	76740	80360	83980	95960	100090	104110	142720	148230	153050	157880	162710
14	67350	71260	74620	77990	89110	92940	96670	132520	137640	142120	146600	151080
15	62860	66510	69650	72790	83170	86740	90230	123690	128640	132650	136830	141010
16	58930	62360	65300	68240	77970	81320	84590	115960	120430	124360	128280	132200
17	55460	58650	61460	64220	73380	76540	79610	109140	113350	117040	120730	124420
18	52380	55430	58040	60660	69310	72280	75190	103070	107050	110540	114020	117510
19	49630	52510	54990	57460	65680	68480	71230	97650	101420	104720	108020	111380
20	47140	49880	52240	54590	62370	65060	67670	92770	96350	99480	102620	105760
21	44900	47510	49750	51990	59400	61960	64450	88350	91760	94750	97740	100720
22	42860	45350	47490	49630	56700	59140	61520	84330	87590	90440	93290	96140
23	40990	43380	45420	47470	54240	56570	58840	80670	83780	86510	89240	91960
24	39290	41570	43530	45490	51980	54210	56390	77330	80290	82900	85520	88130
25	37720	39910	41790	43670	49900	52040	54140	74210	77080	79590	82100	84610
26	36260	38370	40180	41990	47980	50040	52050	73360	76110	78530	80940	83350
27	34920	36950	38690	40440	46200	48190	50130	68720	71310	73690	76020	78340
28	33670	35630	37310	38990	44550	46470	48340	66260	68820	71060	73300	75540
29	32510	34400	36030	37650	43020	44870	46670	63980	66450	68610	70770	72940
30	31430	33260	34820	36390	41580	43370	45110	61840	64230	66320	68410	70510
31	30420	32180	33700	35220	40240	41970	43660	59850	62160	64180	66210	68230
32	29460	31200	32650	34120	38980	40660	42290	57980	60220	62180	64140	66100
33	28570	30230	31660	33080	37800	39430	41010	56220	58390	60290	62200	64100
34	27730	29340	30730	32110	36690	38270	39810	54570	56680	58520	60370	62210
35	26940	28510	29850	31190	35640	37170	38670	53010	55060	56850	58640	60430
36	26190	27710	29020	30330	34650	36140	37590	51540	53530	55270	57010	58760

Fibre stress 16,000 pounds per square inch and include weight of beam.
Weight uniformly distributed.

**SAFE LOADS UNIFORMLY DISTRIBUTED
FOR STANDARD AND SPECIAL
CHANNELS.**

In Tons of 2,000 Lbs.

Distance between Supports in Feet	15" □	Add for every lb. increase in weight	12" □	Add for every lb. increase in weight	10" □	Add for every lb. increase in weight	9" □	Add for every lb. increase in weight
	33 lbs.		20.5 lbs.		15 lbs.		13.25 lbs.	
10	22.23	.39	11.39	.32	7.14	.26	5.61	.24
11	20.20	.35	10.35	.29	6.49	.24	5.10	.21
12	18.52	.33	9.49	.26	5.95	.22	4.68	.20
13	17.10	.30	8.76	.24	5.49	.20	4.32	.18
14	15.87	.28	8.14	.23	5.10	.19	4.01	.17
15	14.82	.26	7.59	.21	4.76	.17	3.74	.16
16	13.89	.24	7.12	.20	4.46	.16	3.51	.15
17	13.07	.23	6.70	.18	4.20	.15	3.30	.14
18	12.35	.22	6.33	.18	3.96	.14	3.12	.13
19	11.70	.21	5.99	.17	3.76	.14	2.95	.12
20	11.11	.20	5.70	.16	3.57	.13	2.81	.12
21	10.58	.19	5.42	.15	3.40	.12	2.67	.11
22	10.10	.18	5.18	.14	3.24	.12	2.55	.11
23	9.66	.17	4.95	.14	3.10	.11	2.44	.10
24	9.26	.16	4.75	.13	2.97	.11	2.34	.10
25	8.89	.16	4.56	.13	2.85	.10	2.24	.09
26	8.55	.15	4.38	.12	2.74	.10	2.16	.09
27	8.23	.14	4.22	.12	2.64	.10	2.08	.09
28	7.94	.14	4.07	.11	2.55	.09	2.00	.08
29	7.66	.13	3.93	.11	2.46	.09	1.93	.08
30	7.41	.13	3.80	.11	2.38	.09	1.87	.08

Safe loads given include weight of channel. Maximum fiber stress, 16,000 lbs. per square inch.

SAFE LOADS UNIFORMLY DISTRIBUTED FOR STANDARD AND SPECIAL CHANNELS.

In Tons of 2,000 Lbs.

Distance between Supports in Feet	8" C		7" C		6" C		5" C		4" C		3" C	
	11.25 lbs.	Add for every lb. increase in weight	9.75 lbs.	Add for every lb. increase in weight	8 lbs.	Add for every lb. increase in weight	6.5 lbs.	Add for every lb. increase in weight	5.25 lbs.	Add for every lb. increase in weight	4 lbs.	Add for every lb. increase in weight
5	8.61	.42	6.68	.36	4.62	.31	3.16	.26	2.02	.21	1.16	.16
6	7.18	.35	5.57	.30	3.85	.26	2.63	.22	1.68	.18	.97	.13
7	6.15	.30	4.77	.26	3.30	.22	2.26	.19	1.44	.15	.83	.11
8	5.38	.26	4.18	.23	2.89	.19	1.98	.16	1.26	.13	.73	.10
9	4.78	.23	3.71	.20	2.57	.17	1.76	.14	1.12	.12	.64	.09
10	4.31	.21	3.34	.18	2.31	.16	1.58	.13	1.01	.11	.58	.08
11	3.91	.19	3.04	.16	2.10	.14	1.44	.12	.92	.10	.53	.07
12	3.59	.18	2.78	.15	1.93	.13	1.32	.11	.84	.09	.48	.07
13	3.31	.16	2.57	.14	1.78	.12	1.22	.10	.78	.08	.45	.06
14	3.08	.15	2.39	.13	1.65	.11	1.13	.09	.72	.08	.41	.06
15	2.87	.14	2.23	.12	1.54	.10	1.05	.09	.67	.07	.39	.05
16	2.69	.13	2.09	.11	1.44	.10	.99	.08	.63	.07	.36	.05
17	2.53	.12	1.96	.11	1.36	.09	.93	.08	.59	.06	.34	.05
18	2.39	.11	1.86	.10	1.28	.09	.88	.07	.56	.06	.32	.04
19	2.27	.11	1.76	.09	1.22	.08	.83	.07	.53	.06	.31	.04
20	2.15	.11	1.67	.09	1.16	.08	.79	.07	.51	.05	.29	.04
21	2.05	.10	1.59	.09	1.10	.07	.75	.06	.48	.05	.28	.04
22	1.96	.10	1.52	.08	1.05	.07	.72	.06	.46	.05	.26	.04
23	1.87	.09	1.45	.08	1.00	.07	.69	.06	.44	.05	.25	.03
24	1.79	.09	1.39	.08	.96	.06	.66	.05	.42	.04	.24	.03
25	1.72	.08	1.34	.07	.92	.06	.63	.05	.40	.04	.23	.03

Safe loads given include weight of channel. Maximum fiber stress, 16,000 lbs. per square inch.

SAFE LOADS IN TONS OF 2,000 LBS. UNIFORMLY DISTRIBUTED FOR TEES.

Size Flange by Stem	Weight per Foot	Distance between Supports in Feet									
		1	2	3	4	5	6	7	8	9	10
5 x3	13.6	6.29	3.15	2.10	1.57	1.26	1.05	0.90	0.79	0.70	0.63
5 x2½	11.0	4.59	2.29	1.53	1.15	0.92	0.76	0.66	0.57	0.51	0.46
4½x3½	15.9	11.36	5.68	3.79	2.84	2.27	1.89	1.62	1.42	1.26	1.14
4½x3	8.06	4.32	2.16	1.44	1.08	0.86	0.72	0.62	0.54	0.48	0.43
4½x3	10.0	5.01	2.51	1.67	1.25	1.00	0.84	0.72	0.63	0.56	0.50
4½x2½	8.0	2.99	1.49	0.96	0.75	0.60	0.48	0.43	0.37	0.32	0.30
4½x2½	9.3	3.47	1.73	1.16	0.87	0.69	0.58	0.50	0.43	0.39	0.35
4 x5	15.7	16.53	8.27	5.51	4.13	3.31	2.76	2.36	2.07	1.84	1.65
4 x5	12.3	12.96	6.48	4.32	3.24	2.59	2.16	1.85	1.62	1.44	1.30
4 x4½	14.8	13.60	6.80	4.53	3.40	2.72	2.27	1.94	1.70	1.51	1.36
4 x4½	11.6	10.56	5.28	3.52	2.64	2.11	1.76	1.51	1.32	1.17	1.06
4 x4	13.9	10.77	5.39	3.59	2.69	2.15	1.80	1.54	1.35	1.20	1.08
4 x4	10.9	8.75	4.37	2.92	2.19	1.75	1.46	1.25	1.09	0.97	0.87
4 x3	9.3	4.69	2.35	1.56	1.17	0.94	0.78	0.67	0.59	0.52	0.47
4 x2½	8.7	3.31	1.65	1.10	0.83	0.66	0.55	0.47	0.41	0.37	0.33
4 x2½	7.4	2.93	1.47	0.98	0.73	0.59	0.49	0.42	0.37	0.33	0.29
4 x2	7.9	2.13	1.07	0.71	0.53	0.43	0.36	0.30	0.27	0.24	0.21
4 x2	6.7	1.81	0.91	0.60	0.45	0.36	0.30	0.26	0.23	0.20	0.18
3½x4	12.8	10.56	5.28	3.52	2.64	2.11	1.76	1.51	1.32	1.17	1.06
3½x4	10.0	8.27	4.13	2.76	2.07	1.65	1.38	1.18	1.03	0.92	0.83
3½x3½	11.9	8.11	4.05	2.70	2.03	1.62	1.35	1.16	1.01	0.90	0.81
3½x3½	9.3	6.35	3.17	2.12	1.59	1.27	1.06	0.91	0.79	0.71	0.63
3½x3	11.0	6.03	3.01	2.01	1.51	1.21	1.00	0.86	0.75	0.67	0.60
3½x3	8.7	4.69	2.35	1.56	1.17	0.94	0.78	0.67	0.59	0.52	0.47
3½x3	7.7	3.84	1.92	1.28	0.96	0.77	0.64	0.55	0.48	0.43	0.38
3 x4	11.9	10.35	5.17	3.45	2.59	2.07	1.72	1.48	1.29	1.15	1.03
3 x4	10.6	9.49	4.75	3.16	2.37	1.90	1.58	1.36	1.19	1.05	0.95
3 x4	9.3	8.37	4.19	2.79	2.09	1.67	1.40	1.20	1.05	0.93	0.84
3 x3½	11.0	7.95	3.97	2.65	1.99	1.59	1.32	1.14	0.99	0.88	0.79
3 x3½	9.8	7.31	3.65	2.44	1.83	1.46	1.22	1.04	0.91	0.81	0.73
3 x3½	8.6	6.45	3.23	2.15	1.61	1.29	1.08	0.92	0.81	0.72	0.65
3 x3	10.1	5.87	2.93	1.96	1.47	1.17	0.98	0.84	0.73	0.65	0.59

Safe loads given include weight of tee. Maximum fiber stress, 16,000 lbs. per square inch.

SAFE LOADS IN TONS OF 2,000 LBS. UNIFORMLY DISTRIBUTED FOR TEES.

Size Flange by Stem	Weight Per Foot	Distance Between Supports in Feet									
		1	2	3	4	5	6	7	8	9	10
3 x3	9.0	5.39	2.69	1.80	1.35	1.08	0.90	0.77	0.67	0.60	0.54
3 x3	7.9	4.59	2.29	1.53	1.15	0.92	0.76	0.66	0.57	0.51	0.46
3 x3	6.8	3.95	1.97	1.32	0.99	0.79	0.66	0.56	0.49	0.44	0.39
3 x2½	7.2	3.20	1.60	1.07	0.80	0.64	0.53	0.46	0.40	0.36	0.32
3 x2½	6.2	2.77	1.39	0.92	0.69	0.55	0.46	0.40	0.35	0.31	0.28
2¾x2	7.4	4.00	2.00	1.33	1.00	0.80	0.67	0.57	0.50	0.44	0.40
2½x3	7.2	4.64	2.32	1.55	1.16	0.93	0.77	0.66	0.58	0.52	0.46
2½x3	6.2	4.05	2.03	1.35	1.01	0.81	0.68	0.58	0.51	0.45	0.41
2½x2¾	6.8	3.89	1.95	1.30	0.97	0.78	0.65	0.56	0.49	0.43	0.39
2½x2¾	5.9	3.20	1.60	1.07	0.80	0.64	0.53	0.46	0.40	0.36	0.32
2½x2½	6.5	3.15	1.57	1.05	0.79	0.63	0.52	0.45	0.39	0.35	0.31
2½x2½	5.6	2.67	1.33	0.89	0.67	0.53	0.44	0.38	0.33	0.30	0.27
2½x1¼	3.0	0.48	0.24	0.16	0.12	0.10	0.08	0.07	0.06	0.05	0.05
2¼x2¼	5.0	2.24	1.12	0.75	0.56	0.45	0.37	0.32	0.28	0.25	0.22
2¼x2¼	4.2	1.71	0.85	0.57	0.43	0.34	0.28	0.24	0.21	0.19	0.17
2 x2	4.4	1.76	0.88	0.59	0.44	0.35	0.29	0.25	0.22	0.20	0.18
2 x2	3.7	1.33	0.67	0.44	0.33	0.27	0.22	0.19	0.17	0.15	0.13
2 x1½	3.2	0.80	0.40	0.27	0.20	0.16	0.13	0.11	0.10	0.09	0.08
1¾x1¾	3.2	1.01	0.51	0.34	0.25	0.20	0.17	0.14	0.13	0.11	0.10
1¾x1¾	3.7	0.80	0.40	0.27	0.20	0.16	0.13	0.11	0.10	0.09	0.08
1½x1½	2.6	0.75	0.37	0.25	0.19	0.15	0.12	0.11	0.09	0.08	0.07
1½x1½	2.0	0.59	0.29	0.20	0.15	0.12	0.10	0.08	0.07	0.07	0.06
1¼x1¼	2.1	0.53	0.27	0.18	0.13	0.11	0.09	0.08	0.07	0.06	0.05
1¼x1¼	1.7	0.37	0.19	0.12	0.09	0.07	0.06	0.05	0.05	0.04	0.04
1 x1	1.3	0.27	0.13	0.09	0.07	0.05	0.04	0.04	0.03	0.03	0.03
1 x1	1.0	0.16	0.08	0.05	0.04	0.03	0.03	0.02	0.02	0.02	0.02

Safe loads given include weight of tee. Maximum fiber stress, 16,000 lbs. per square inch.

WEIGHTS AND DIMENSIONS STEEL "Z" BARS.

Depth of Bar in Inches.	Length of Legs in Inches.	Thickness of Web and Legs in Inches.	Estimated Weight per foot in Pounds.	Area of Section, Sq. Inches.
3	2 $\frac{11}{16}$	$\frac{1}{4}$	6.7	1.97
3 $\frac{1}{16}$	2 $\frac{3}{4}$	$\frac{1}{8}$	8.4	2.48
3	2 $\frac{11}{16}$	$\frac{3}{8}$	9.7	2.86
3 $\frac{1}{16}$	2 $\frac{3}{4}$	$\frac{1}{8}$	11.4	3.36
3	2 $\frac{11}{16}$	$\frac{1}{2}$	12.5	3.69
3 $\frac{1}{16}$	2 $\frac{3}{4}$	$\frac{1}{8}$	14.2	4.18
4	3 $\frac{1}{16}$	$\frac{1}{4}$	8.2	2.41
4 $\frac{1}{16}$	3 $\frac{1}{8}$	$\frac{1}{8}$	10.3	3.03
4 $\frac{1}{2}$	3 $\frac{1}{16}$	$\frac{3}{8}$	12.4	3.66
4	3 $\frac{1}{16}$	$\frac{1}{8}$	13.8	4.05
4 $\frac{1}{16}$	3 $\frac{1}{8}$	$\frac{1}{2}$	15.8	4.66
4 $\frac{1}{2}$	3 $\frac{1}{16}$	$\frac{1}{8}$	17.9	5.27
4	3 $\frac{1}{16}$	$\frac{5}{8}$	18.9	5.55
4 $\frac{1}{16}$	3 $\frac{1}{8}$	$\frac{11}{16}$	20.9	6.14
4 $\frac{1}{2}$	3 $\frac{1}{16}$	$\frac{3}{4}$	23.0	6.75
5	3 $\frac{1}{4}$	$\frac{1}{8}$	11.6	3.40
5 $\frac{1}{16}$	3 $\frac{1}{16}$	$\frac{3}{8}$	13.9	4.10
5 $\frac{1}{8}$	3 $\frac{3}{8}$	$\frac{1}{8}$	16.4	4.81
5	3 $\frac{1}{4}$	$\frac{1}{2}$	17.9	5.25
5 $\frac{1}{16}$	3 $\frac{5}{16}$	$\frac{1}{8}$	20.2	5.94
5 $\frac{1}{8}$	3 $\frac{3}{8}$	$\frac{5}{8}$	22.6	6.64
5	3 $\frac{1}{4}$	$\frac{11}{16}$	23.7	6.96
5 $\frac{1}{16}$	3 $\frac{1}{16}$	$\frac{3}{4}$	26.0	7.64
5 $\frac{1}{8}$	3 $\frac{3}{8}$	$\frac{11}{16}$	28.3	8.33
6	3 $\frac{1}{2}$	$\frac{3}{8}$	15.6	4.59
6 $\frac{1}{16}$	3 $\frac{9}{16}$	$\frac{1}{8}$	18.3	5.39
6 $\frac{1}{8}$	3 $\frac{5}{8}$	$\frac{1}{2}$	21.0	6.19
6	3 $\frac{1}{2}$	$\frac{1}{8}$	22.7	6.68
6 $\frac{1}{16}$	3 $\frac{1}{16}$	$\frac{5}{8}$	25.4	7.46
6 $\frac{1}{8}$	3 $\frac{5}{8}$	$\frac{11}{16}$	28.0	8.25
6	3 $\frac{1}{2}$	$\frac{3}{4}$	29.3	8.63
6 $\frac{1}{16}$	3 $\frac{1}{16}$	$\frac{11}{16}$	31.9	9.39
6 $\frac{1}{8}$	3 $\frac{5}{8}$	$\frac{7}{8}$	34.6	10.17

**SAFE LOADS IN TONS OF 2,000 LBS.
UNIFORMLY DISTRIBUTED FOR
STANDARD Z-BARS**

Size Inches	Thickness of Metal	Distance between Supports in Feet									
		4	5	6	7	8	9	10	12	14	16
6	$\frac{3}{8}$	11.25	9.00	7.50	6.43	5.63	5.00	4.50	3.75	3.21	2.81
$6\frac{1}{16}$	$\frac{7}{16}$	13.11	10.48	8.73	7.48	6.55	5.82	5.24	4.37	3.74	3.28
$6\frac{1}{8}$	$\frac{1}{2}$	14.96	11.97	9.97	8.55	7.48	6.65	5.99	4.99	4.28	3.74
6	$\frac{9}{16}$	15.40	12.32	10.27	8.80	7.70	6.84	6.16	5.13	4.40	3.85
$6\frac{1}{16}$	$\frac{5}{8}$	17.09	13.67	11.40	9.76	8.55	7.60	6.84	5.70	4.88	4.27
$6\frac{1}{8}$	$\frac{11}{16}$	18.80	15.04	12.53	10.74	9.40	8.36	7.52	6.27	5.37	4.70
6	$\frac{3}{4}$	18.72	14.98	12.48	10.70	9.36	8.32	7.49	6.24	5.35	4.68
$6\frac{1}{16}$	$\frac{13}{16}$	20.29	16.23	13.53	11.59	10.15	9.02	8.12	6.76	5.80	5.07
$6\frac{1}{8}$	$\frac{7}{8}$	21.86	17.49	14.57	12.49	10.93	9.72	8.75	7.29	6.25	5.47
5	$\frac{1}{8}$	7.12	5.70	4.75	4.07	3.56	3.17	2.85	2.37	2.03	1.78
$5\frac{1}{16}$	$\frac{3}{8}$	8.52	6.82	5.68	4.87	4.26	3.79	3.41	2.84	2.43	2.13
$5\frac{1}{8}$	$\frac{7}{16}$	9.92	7.94	6.62	5.67	4.96	4.41	3.97	3.31	2.83	2.48
5	$\frac{1}{2}$	10.24	8.19	6.83	5.85	5.12	4.55	4.09	3.41	2.92	2.56
$5\frac{1}{16}$	$\frac{9}{16}$	11.49	9.19	7.66	6.56	5.75	5.11	4.60	3.83	3.28	2.87
$5\frac{1}{8}$	$\frac{5}{8}$	12.76	10.21	8.51	7.29	6.38	5.67	5.11	4.25	3.65	3.19
5	$\frac{11}{16}$	12.63	10.10	8.42	7.21	6.32	5.61	5.05	4.21	3.61	3.16
$5\frac{1}{16}$	$\frac{3}{4}$	13.79	11.03	9.19	7.88	6.89	6.13	5.52	4.60	3.94	3.45
$5\frac{1}{8}$	$\frac{13}{16}$	14.94	11.95	9.96	8.54	7.47	6.64	5.97	4.98	4.27	3.73
4	$\frac{1}{4}$	4.19	3.35	2.79	2.39	2.09	1.86	1.68	1.40	1.20	1.05
$4\frac{1}{16}$	$\frac{5}{16}$	5.21	4.17	3.48	2.98	2.60	2.32	2.08	1.74	1.49	1.30
$4\frac{1}{8}$	$\frac{3}{8}$	6.22	4.98	4.15	3.56	3.11	2.77	2.49	2.08	1.78	1.56
4	$\frac{7}{16}$	6.44	5.15	4.29	3.68	3.22	2.86	2.57	2.15	1.84	1.61
$4\frac{1}{16}$	$\frac{1}{2}$	7.33	5.87	4.89	4.19	3.67	3.26	2.93	2.44	2.09	1.83
$4\frac{1}{8}$	$\frac{9}{16}$	8.24	6.59	5.49	4.71	4.12	3.66	3.29	2.75	2.35	2.06
4	$\frac{5}{8}$	8.06	6.45	5.37	4.61	4.03	3.58	3.23	2.69	2.31	2.01
$4\frac{1}{16}$	$\frac{11}{16}$	8.86	7.09	5.91	5.06	4.43	3.95	3.55	2.96	2.53	2.21
$4\frac{1}{8}$	$\frac{3}{4}$	9.68	7.74	6.45	5.53	4.84	4.30	3.87	3.23	2.76	2.42
3	$\frac{1}{4}$	2.56	2.05	1.71	1.46	1.28	1.14	1.03	0.85	0.73	0.64
$3\frac{1}{16}$	$\frac{5}{16}$	3.17	2.54	2.12	1.81	1.58	1.41	1.27	1.06	0.91	0.79
3	$\frac{3}{8}$	3.44	2.74	2.28	1.96	1.72	1.52	1.37	1.14	0.98	0.86
$3\frac{1}{16}$	$\frac{7}{16}$	3.97	3.18	2.65	2.27	1.98	1.77	1.59	1.32	1.13	0.99
3	$\frac{1}{2}$	4.08	3.26	2.72	2.33	2.04	1.81	1.63	1.36	1.17	1.02
$3\frac{1}{16}$	$\frac{9}{16}$	4.57	3.66	3.05	2.62	2.28	2.03	1.83	1.52	1.31	1.14

Safe loads given include weight of Z-bar. Maximum fiber stress, 16,000 lbs. per square inch.

**SAFE LOADS IN TONS OF 2,000 LBS. UNIFORMLY
DISTRIBUTED FOR STANDARD AND SPECIAL
ANGLES WITH UNEQUAL LEGS.**

Long Leg Vertical.

Size of Angle		Distance Between Supports in Feet									
		1	2	3	4	5	6	7	8	9	10
*8	x3 $\frac{1}{2}$ x $\frac{1}{8}$	42.59	21.29	14.20	10.65	8.52	7.10	6.08	5.32	4.73	4.26
*7	x3 $\frac{1}{2}$ x1	56.43	28.21	18.81	14.11	11.29	9.40	8.06	7.05	6.27	5.64
*7	x3 $\frac{1}{2}$ x $\frac{7}{16}$	26.72	13.36	8.91	6.68	5.34	4.45	3.82	3.34	2.97	2.67
6	x4 x1	42.77	21.39	14.26	10.69	8.55	7.13	6.11	5.35	4.75	4.28
6	x4 x $\frac{3}{8}$	17.71	8.85	5.90	4.43	3.54	2.95	2.53	2.21	1.97	1.77
6	x3 $\frac{1}{2}$ x1	41.76	20.88	13.92	10.44	8.35	6.96	5.97	5.22	4.64	4.18
6	x3 $\frac{1}{2}$ x $\frac{3}{8}$	17.33	8.67	5.78	4.33	3.47	2.89	2.48	2.17	1.93	1.73
*5	x4 x $\frac{7}{8}$	26.61	13.31	8.87	6.65	5.32	4.44	3.80	3.33	2.96	2.66
*5	x4 x $\frac{3}{8}$	12.48	6.24	4.16	3.12	2.50	2.08	1.78	1.56	1.39	1.25
5	x3 $\frac{1}{2}$ x $\frac{7}{8}$	26.03	13.01	8.68	6.51	5.21	4.34	3.72	3.25	2.89	2.60
5	x3 $\frac{1}{2}$ x $\frac{5}{16}$	10.35	5.18	3.45	2.59	2.07	1.73	1.48	1.29	1.15	1.04
5	x3 x $\frac{13}{16}$	23.73	11.87	7.91	5.93	4.75	3.96	3.39	2.97	2.64	2.37
5	x3 x $\frac{5}{16}$	10.08	5.04	3.36	2.52	2.02	1.68	1.44	1.26	1.12	1.01
*4 $\frac{1}{2}$	x3 x $\frac{5}{16}$	19.31	9.65	6.44	4.83	3.86	3.22	2.76	2.41	2.15	1.93
*4 $\frac{1}{2}$	x3 x $\frac{3}{16}$	8.21	4.11	2.74	2.05	1.64	1.37	1.17	1.03	0.91	0.82
*4	x3 $\frac{1}{2}$ x $\frac{13}{16}$	15.57	7.79	5.19	3.89	3.11	2.60	2.22	1.95	1.73	1.56
*4	x3 $\frac{1}{2}$ x $\frac{5}{16}$	6.72	3.36	2.24	1.68	1.34	1.12	0.96	0.84	0.75	0.67
4	x3 x $\frac{13}{16}$	15.31	7.65	5.10	3.83	3.06	2.55	2.19	1.91	1.70	1.53
4	x3 x $\frac{5}{16}$	6.56	3.28	2.19	1.64	1.31	1.10	0.94	0.82	0.73	0.66
3 $\frac{1}{2}$	x3 x $\frac{13}{16}$	11.73	5.87	3.91	2.93	2.35	1.96	1.68	1.47	1.30	1.17
3 $\frac{1}{2}$	x3 x $\frac{5}{16}$	5.12	2.56	1.71	1.28	1.02	0.85	0.73	0.64	0.57	0.51
3 $\frac{1}{2}$	x2 $\frac{1}{2}$ x $\frac{13}{16}$	9.87	4.93	3.29	2.47	1.97	1.64	1.41	1.23	1.10	0.99
3 $\frac{1}{2}$	x2 $\frac{1}{2}$ x $\frac{5}{16}$	4.00	2.00	1.33	1.00	0.80	0.67	0.57	0.50	0.44	0.40
*3 $\frac{1}{4}$	x2 x $\frac{9}{16}$	6.93	3.47	2.31	1.73	1.39	1.16	0.99	0.87	0.77	0.69
*3 $\frac{1}{4}$	x2 x $\frac{1}{4}$	3.36	1.68	1.12	0.84	0.67	0.56	0.48	0.42	0.37	0.34
3	x2 $\frac{1}{2}$ x $\frac{9}{16}$	6.13	3.07	2.04	1.53	1.23	1.02	0.88	0.77	0.68	0.61
3	x2 $\frac{1}{2}$ x $\frac{1}{4}$	2.99	1.50	1.00	0.75	0.60	0.50	0.43	0.37	0.33	0.30
*3	x2 x $\frac{1}{2}$	5.33	2.67	1.78	1.33	1.07	0.89	0.76	0.67	0.59	0.53
*3	x2 x $\frac{1}{4}$	2.88	1.44	0.96	0.72	0.58	0.48	0.41	0.36	0.32	0.29
2 $\frac{1}{2}$	x2 x $\frac{1}{2}$	3.73	1.87	1.24	0.93	0.75	0.62	0.53	0.47	0.41	0.37
2 $\frac{1}{2}$	x2 x $\frac{3}{16}$	1.55	0.77	0.52	0.39	0.31	0.26	0.22	0.19	0.17	0.16
*2 $\frac{1}{4}$	x1 $\frac{1}{2}$ x $\frac{1}{2}$	2.87	1.43	0.96	0.72	0.57	0.48	0.41	0.36	0.32	0.29
*2 $\frac{1}{4}$	x1 $\frac{1}{2}$ x $\frac{3}{16}$	1.23	0.61	0.41	0.31	0.25	0.21	0.18	0.15	0.14	0.12
*2	x1 $\frac{3}{8}$ x $\frac{1}{4}$	1.23	0.61	0.41	0.31	0.25	0.21	0.18	0.15	0.14	0.12
*2	x1 $\frac{3}{8}$ x $\frac{3}{16}$	0.96	0.48	0.32	0.24	0.19	0.16	0.14	0.12	0.11	0.10
*1 $\frac{3}{8}$	x1 x $\frac{1}{4}$	0.48	0.24	0.16	0.12	0.10	0.08	0.07	0.06	0.05	0.05
*1 $\frac{3}{8}$	x1 x $\frac{1}{8}$	0.32	0.16	0.11	0.08	0.06	0.05	0.05	0.04	0.04	0.03

Safe loads given include weight of angle. Maximum fiber stress, 16,000 lbs. per square inch. Neutral axis through center of gravity parallel to short leg. Angles marked * are special.

SAFE LOADS IN TONS OF 2,000 LBS. UNIFORMLY DISTRIBUTED FOR STANDARD AND SPECIAL ANGLES WITH UNEQUAL LEGS.

Short Leg Vertical

Size of Angle	Distance between Supports in Feet									
	1	2	3	4	5	6	7	8	9	10
*8 x3 $\frac{1}{2}$ x $\frac{11}{16}$	9.53	4.76	3.18	2.38	1.91	1.59	1.36	1.19	1.06	0.95
*7 x3 $\frac{1}{2}$ x1	15.79	7.89	5.26	3.95	3.16	2.63	2.26	1.97	1.75	1.58
*7 x3 $\frac{1}{2}$ x $\frac{7}{16}$	7.84	3.92	2.61	1.96	1.57	1.31	1.12	0.98	0.87	0.78
6 x4 x1	20.21	10.11	6.74	5.05	4.04	3.37	2.89	2.53	2.25	2.02
6 x4 x $\frac{3}{8}$	8.53	4.27	2.84	2.13	1.71	1.42	1.22	1.07	0.95	0.85
6 x3 $\frac{1}{2}$ x1	15.47	7.74	5.16	3.87	3.09	2.58	2.21	1.93	1.72	1.55
6 x3 $\frac{1}{2}$ x $\frac{3}{8}$	6.56	3.28	2.19	1.64	1.31	1.09	0.94	0.82	0.73	0.66
*5 x4 x $\frac{7}{8}$	17.65	8.83	5.88	4.41	3.53	2.94	2.52	2.21	1.96	1.77
*5 x4 x $\frac{3}{8}$	8.37	4.19	2.79	2.09	1.67	1.40	1.20	1.05	0.93	0.84
5 x3 $\frac{1}{2}$ x $\frac{7}{8}$	13.44	6.72	4.48	3.36	2.69	2.24	1.92	1.68	1.49	1.34
5 x3 $\frac{1}{2}$ x $\frac{5}{16}$	5.44	2.72	1.81	1.36	1.09	0.91	0.78	0.68	0.60	0.54
5 x3 x $\frac{5}{16}$	9.28	4.64	3.09	2.32	1.86	1.55	1.33	1.16	1.03	0.93
5 x3 x $\frac{3}{16}$	4.00	2.00	1.33	1.00	0.80	0.67	0.57	0.50	0.44	0.40
*4 $\frac{1}{2}$ x3 x $\frac{13}{16}$	9.12	4.56	3.04	2.28	1.82	1.52	1.30	1.14	1.01	0.91
*4 $\frac{1}{2}$ x3 x $\frac{5}{16}$	4.05	2.03	1.35	1.01	0.81	0.68	0.58	0.51	0.45	0.41
*4 x3 $\frac{1}{2}$ x $\frac{13}{16}$	12.27	6.13	4.09	3.07	2.45	2.05	1.75	1.53	1.36	1.23
*4 x3 $\frac{1}{2}$ x $\frac{5}{16}$	5.39	2.69	1.80	1.35	1.08	0.90	0.77	0.67	0.60	0.54
4 x3 x $\frac{13}{16}$	8.96	4.48	2.99	2.24	1.79	1.49	1.28	1.12	1.00	0.90
4 x3 x $\frac{5}{16}$	3.95	1.97	1.32	0.99	0.79	0.66	0.56	0.49	0.44	0.39
3 $\frac{1}{2}$ x3 x $\frac{13}{16}$	8.80	4.40	2.93	2.20	1.76	1.47	1.26	1.10	0.98	0.88
3 $\frac{1}{2}$ x3 x $\frac{5}{16}$	3.84	1.92	1.28	0.96	0.77	0.64	0.55	0.48	0.43	0.38
3 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{13}{16}$	5.28	2.64	1.76	1.32	1.06	0.88	0.75	0.66	0.59	0.53
3 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{5}{16}$	2.19	1.09	0.73	0.55	0.44	0.36	0.31	0.27	0.24	0.22
*3 $\frac{1}{4}$ x2 x $\frac{9}{16}$	2.83	1.41	0.94	0.71	0.57	0.47	0.40	0.35	0.31	0.28
*3 $\frac{1}{4}$ x2 x $\frac{5}{16}$	1.39	0.69	0.46	0.35	0.28	0.23	0.20	0.17	0.15	0.14
3 x2 $\frac{1}{2}$ x $\frac{9}{16}$	4.37	2.19	1.46	1.09	0.87	0.73	0.62	0.55	0.49	0.44
3 x2 $\frac{1}{2}$ x $\frac{5}{16}$	2.13	1.07	0.71	0.53	0.43	0.36	0.30	0.27	0.24	0.21
*3 x2 x $\frac{1}{2}$	2.51	1.25	0.84	0.63	0.50	0.42	0.36	0.31	0.28	0.25
*3 x2 x $\frac{5}{16}$	1.33	0.67	0.44	0.33	0.27	0.22	0.19	0.17	0.15	0.13
2 $\frac{1}{2}$ x2 x $\frac{1}{2}$	2.45	1.23	0.82	0.61	0.49	0.41	0.35	0.31	0.27	0.25
2 $\frac{1}{2}$ x2 x $\frac{3}{16}$	1.07	0.53	0.36	0.27	0.21	0.18	0.15	0.13	0.12	0.11
*2 $\frac{1}{4}$ x1 $\frac{1}{2}$ x $\frac{1}{2}$	1.39	0.69	0.46	0.35	0.28	0.23	0.20	0.17	0.15	0.14
*2 $\frac{1}{4}$ x1 $\frac{1}{2}$ x $\frac{3}{16}$	0.59	0.29	0.20	0.15	0.12	0.10	0.08	0.07	0.07	0.06
*2 x1 $\frac{3}{8}$ x $\frac{1}{4}$	0.64	0.32	0.21	0.16	0.13	0.11	0.09	0.08	0.07	0.06
*2 x1 $\frac{3}{8}$ x $\frac{3}{16}$	0.48	0.24	0.16	0.12	0.10	0.08	0.07	0.06	0.05	0.05
*1 $\frac{3}{8}$ x1 x $\frac{1}{4}$	0.27	0.13	0.09	0.07	0.05	0.04	0.04	0.03	0.03	0.03
*1 $\frac{3}{8}$ x1 x $\frac{3}{8}$	0.16	0.08	0.05	0.04	0.03	0.03	0.02	0.02	0.02	0.02

Safe loads given include weight of angle. Maximum fiber stress, 16,000 lbs. per square inch. Neutral axis through center of gravity parallel to long leg. Angles marked * are special.

SAFE LOADS IN TONS OF 2,000 LBS. UNIFORMLY DISTRIBUTED FOR STANDARD AND SPECIAL ANGLES WITH EQUAL LEGS

Size of Angle	Distance between Supports in Feet									
	1	2	3	4	5	6	7	8	9	10
8 x8 x 1 1/8	93.49	46.74	31.16	23.37	18.70	15.58	13.36	11.69	10.39	9.35
8 x8 x 1/2	44.64	22.32	14.88	11.16	8.93	7.44	6.38	5.58	4.96	4.46
6 x6 x 1	45.72	22.86	15.24	11.43	9.14	7.62	6.53	5.72	5.08	4.57
6 x6 x 3/8	18.82	9.41	6.27	4.70	3.76	3.14	2.69	2.35	2.09	1.88
*5 x5 x 1	30.91	15.45	10.30	7.73	6.18	5.15	4.42	3.86	3.43	3.09
*5 x5 x 3/8	12.91	6.45	4.30	3.23	2.58	2.15	1.84	1.61	1.43	1.29
4 x4 x 1 1/8	16.05	8.03	5.35	4.01	3.21	2.68	2.29	2.01	1.78	1.61
4 x4 x 3/8	6.88	3.44	2.29	1.72	1.38	1.15	0.98	0.86	0.76	0.69
3 1/2 x3 1/2 x 1 1/8	12.00	6.00	4.00	3.00	2.40	2.00	1.71	1.50	1.33	1.20
3 1/2 x3 1/2 x 3/8	5.20	2.60	1.73	1.30	1.04	0.87	0.74	0.65	0.58	0.52
3 x3 x 5/8	6.93	3.47	2.31	1.73	1.39	1.16	0.99	0.87	0.77	0.69
3 x3 x 1/2	3.09	1.55	1.03	0.77	0.62	0.52	0.44	0.39	0.34	0.31
*2 3/4 x2 3/4 x 1/2	4.75	2.37	1.58	1.19	0.95	0.79	0.68	0.59	0.53	0.47
*2 3/4 x2 3/4 x 1/4	2.56	1.28	0.85	0.64	0.51	0.43	0.37	0.32	0.28	0.26
2 1/2 x2 1/2 x 1/2	3.89	1.95	1.29	0.97	0.78	0.65	0.56	0.49	0.43	0.39
2 1/2 x2 1/2 x 3/8	1.61	0.81	0.54	0.40	0.32	0.27	0.23	0.20	0.18	0.16
*2 1/4 x2 1/4 x 1/2	3.09	1.55	1.03	0.77	0.62	0.52	0.44	0.39	0.34	0.31
*2 1/4 x2 1/4 x 3/8	1.30	0.65	0.43	0.32	0.26	0.22	0.19	0.16	0.14	0.13
2 x2 x 7/8	2.13	1.07	0.71	0.53	0.43	0.36	0.30	0.27	0.24	0.21
2 x2 x 3/8	1.01	0.51	0.34	0.25	0.20	0.17	0.14	0.13	0.11	0.10
1 3/4 x1 3/4 x 3/8	1.60	0.80	0.53	0.40	0.32	0.27	0.23	0.20	0.18	0.16
1 3/4 x1 3/4 x 1/8	0.75	0.37	0.25	0.19	0.15	0.12	0.11	0.093	0.083	0.075
1 1/2 x1 1/2 x 3/8	1.01	0.51	0.34	0.25	0.20	0.17	0.14	0.130	0.110	0.100
1 1/2 x1 1/2 x 1/8	0.38	0.19	0.13	0.096	0.077	0.064	0.055	0.048	0.043	0.038
1 1/4 x1 1/4 x 3/8	0.58	0.29	0.19	0.150	0.120	0.097	0.083	0.073	0.065	0.058
1 1/4 x1 1/4 x 1/8	0.26	0.13	0.087	0.065	0.052	0.044	0.037	0.033	0.029	0.026
1 x1 x 1/4	0.30	0.15	0.100	0.075	0.060	0.050	0.043	0.037	0.033	0.030
1 x1 x 3/8	0.17	0.083	0.055	0.041	0.033	0.028	.024	0.021	0.018	0.017
* 7/8 x 7/8 x 3/8	0.18	0.088	0.059	0.044	0.035	0.029	0.025	0.022	0.020	0.018
* 7/8 x 7/8 x 1/8	0.12	0.061	0.041	0.031	0.025	0.020	0.018	0.015	0.014	0.012
* 3/4 x 3/4 x 3/8	0.13	0.064	0.043	0.032	0.026	0.021	0.018	0.016	0.014	0.013
* 3/4 x 3/4 x 1/8	0.091	0.045	0.030	0.023	0.018	0.015	0.013	0.011	0.010	0.009

Safe loads given include weight of angle. Maximum fiber stress, 16,000 lbs. per square inch. Neutral axis through center of gravity parallel to one leg. Angles marked * are special.

SHEARING AND BEARING VALUE OF RIVETS.

ALL DIMENSIONS IN INCHES.

DIAMETER-RIVET			SINGLE SHEAR IN POUNDS	BEARING VALUE IN POUNDS PER SQUARE INCH FOR DIFFERENT THICKNESS PLATE													
INCHES		AREA Square Inches															
Frac.	Dec.			1-4	5-16	3-8	7-16	1-2	9-16	5-8	11-16	3-4	13-16	7-8	15-16	1 in.	
$\frac{3}{8}$	.375	.1104	660	1130	1410	1690										
$\frac{1}{2}$	.50	.1963	1180	1500	1880	2550	2630	3000								
$\frac{5}{8}$	.625	.3063	6000	1800	2340	2810	3280	3750	4220	4690						
$\frac{3}{4}$	.75	.4418	lbs.	2250	2810	3380	3940	4500	5060	5630	6190	6750				
$\frac{7}{8}$	.875	.6013	3610	2630	3280	3940	4590	5250	5910	6560	7220	7880	8530	9190	9840	
1 in.	1.00	.7854	4710	3000	3750	4500	5250	6000	6750	7500	8250	9000	9750	10500	12250	12000	
$\frac{3}{8}$	.375	.1104	830	1410	1760	2110										
$\frac{1}{2}$	.50	.1963	1470	1880	2340	2810	3280	3750								
$\frac{5}{8}$	.625	.3063	7500	2340	2930	3520	4100	4690	5280	5860						
$\frac{3}{4}$	.75	.4418	lbs.	2810	3520	4220	4920	5630	6330	7030	7720	8440	10670			
$\frac{7}{8}$	.875	.6013	4510	3280	4100	4920	5740	6560	7380	8200	9030	9850	10670	11480	12300	
1 in.	1.00	.7854	5890	3750	4690	5620	6560	7500	8440	9380	10310	11250	12190	13130	14060	15000	
$\frac{3}{8}$	.375	.1104	1100	1880	2340	2810										
$\frac{1}{2}$	.50	.1963	1960	2500	3130	3750	4380	5000								
$\frac{5}{8}$	.625	.3063	10000	3130	3910	4690	5470	6250	7030	7810						
$\frac{3}{4}$	.75	.4418	lbs.	3750	4690	5630	6560	7500	8440	9380	10310	11250				
$\frac{7}{8}$	.875	.6013	6010	4380	5470	6570	7660	8750	9840	10940	12030	13130	14220	15310	16410	
1 in.	1.00	.7854	7850	5000	6250	7500	8750	10000	11250	12500	13750	15000	16250	17500	18750	20000	
$\frac{3}{8}$	.375	.1104	1320	2350	2930	3520										
$\frac{1}{2}$	.50	.1963	2360	3130	3910	4690	5470	6250								
$\frac{5}{8}$	.625	.3063	12000	3910	4880	5860	6840	7810	8790	9770						
$\frac{3}{4}$	.75	.4418	lbs.	4690	5860	7030	8210	9380	10550	11720	12890	14060				
$\frac{7}{8}$	.875	.6013	7220	5470	6840	8210	9580	10940	12310	13670	15040	16410	17770	19140	20510	
1 in.	1.00	.7854	9430	6250	7820	9380	10940	12500	14060	15630	17190	18750	20320	21880	23440	25000	

ESTIMATED WEIGHTS PER HUNDRED RIVETS.

CONE-HEAD BOILER RIVETS OF SCANT DIAMETER.

Length	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$ *	$1\frac{1}{4}$ *
Inch								
$\frac{3}{4}$	8.75	13.7	16.20					
$\frac{7}{8}$	9.35	14.4	17.22					
1	10.00	15.2	18.25	21.70	26.55			
$1\frac{1}{8}$	10.70	16.0	19.28	23.10	28.00			
$1\frac{1}{4}$	11.40	16.8	20.31	24.50	29.45	37.0	46	60
$1\frac{3}{8}$	12.10	17.6	21.34	25.90	30.90	38.6	48	63
$1\frac{1}{2}$	12.80	18.4	22.37	27.30	32.35	40.2	50	65
$1\frac{5}{8}$	13.50	19.2	23.40	28.70	33.80	41.9	52	67
$1\frac{3}{4}$	14.20	20.0	24.43	30.10	35.25	43.5	54	69
$1\frac{7}{8}$	14.90	20.8	25.46	31.50	36.70	45.2	56	71
2	15.60	21.6	26.49	32.90	38.15	47.	58	74
$2\frac{1}{8}$	16.30	22.4	27.52	34.30	39.60	48.7	60	77
$2\frac{1}{4}$	17.00	23.2	28.55	35.70	41.05	50.3	62	80
$2\frac{3}{8}$	17.70	24.0	29.58	37.10	42.50	51.9	64	83
$2\frac{1}{2}$	18.40	24.8	30.61	38.50	43.95	53.5	66	86
$2\frac{5}{8}$	19.10	25.6	31.64	39.90	45.40	55.1	68	89
$2\frac{3}{4}$	19.80	26.4	32.67	41.30	46.85	56.8	70	92
$2\frac{7}{8}$	20.50	27.2	33.70	42.70	48.30	58.4	72	95
3	21.20	28.0	34.73	44.10	49.75	60.	74	98
$3\frac{1}{4}$	22.60	29.7	36.79	46.90	52.65	63.3	78	103
$3\frac{1}{2}$	24.00	31.5	38.85	49.70	55.55	66.5	82	108
$3\frac{3}{4}$	25.40	33.3	40.91	52.50	58.45	69.8	86	113
4	26.80	35.2	42.97	55.30	61.35	73.	90	118
$4\frac{1}{4}$	28.20	36.9	45.00	58.10	64.25	76.3	94	124
$4\frac{1}{2}$	29.60	38.6	47.09	60.90	67.15	79.5	98	130
$4\frac{3}{4}$	31.00	40.3	49.15	63.70	70.05	82.8	102	136
5	32.40	42.0	51.21	66.50	72.95	86.	106	142
$5\frac{1}{4}$	33.80	43.7	53.27	69.20	75.85	89.3	110	148
$5\frac{1}{2}$	35.20	45.4	55.33	72.00	78.75	92.5	114	154
$5\frac{3}{4}$	36.60	47.1	57.39	74.80	81.65	95.7	118	160
6	38.00	48.8	59.45	77.60	84.55	99.	122	166
$6\frac{1}{2}$	40.80	52.0	63.57	83.30	90.35	105.5	130	177
7	43.60	55.2	67.69	88.90	96.15	112	138	188
Heads....	5.50	8.40	11.50	13.20	18.00	23.0	29.0	38.0
								56.0
								77.5

*These two sizes are calculated for exact diameter.

Rivets with Button-Heads weigh approximately the same as Cone-Head Rivets.

TABLE OF RIVETS IN 100 LBS.

Approximate Number.

Length Rivets	Diameter of Rivets.											
	1-8	3-16	1-4	5-16	3-8	7-16	1-2	5-8	11-16	3-4	7-8	1
$\frac{1}{2}$	17500	15900	8000	5100	3200	1900	.....	.....	.....	.....	.....	.....
$\frac{5}{8}$	16000	13800	7000	4500	2900	1800	.....	.....	.....	.....	.....	.....
$\frac{3}{4}$	14400	12200	6300	4100	2373	1476	1103	642	.....	.....	.....	.....
$\frac{7}{8}$	13500	10900	5700	3700	2190	1371	1030	604	.....	.....	.....	.....
1	12600	9800	5200	3400	2034	1280	968	571	400	345	.....	.....
$1\frac{1}{8}$	11600	9000	4700	3100	1898	1200	910	541	382	322	208	.....
$1\frac{1}{4}$	10800	8300	4400	2900	1780	1129	862	514	365	311	206	.....
$1\frac{3}{8}$	10000	7600	4100	2700	1675	1066	815	489	350	295	204	.....
$1\frac{1}{2}$	9300	7100	4000	2500	1582	1010	776	462	335	284	201	.....
$1\frac{5}{8}$	8700	.....	3800	2300	1498	960	740	446	324	275	199	132
$1\frac{3}{4}$	8100	6300	3500	2200	1424	914	707	428	311	266	192	128
$1\frac{7}{8}$	.....	.....	3400	2000	1356	872	672	411	302	257	185	124
2	.....	5600	3000	1900	1295	834	648	395	293	249	178	120
$2\frac{1}{8}$	.....	.....	.....	.....	1238	800	623	381	285	240	172	116
$2\frac{1}{4}$	.....	5000	2800	1800	1187	768	599	367	277	233	167	112
$2\frac{3}{8}$	.....	.....	.....	.....	1139	738	577	354	269	226	162	108
$2\frac{1}{2}$	.....	4600	2500	1700	1095	711	556	343	261	219	157	104
$2\frac{5}{8}$	.....	.....	.....	.....	1052	687	537	332	253	212	152	100
$2\frac{3}{4}$	.....	4200	2300	1500	1017	662	519	321	245	206	148	96
$2\frac{7}{8}$	.....	.....	.....	.....	982	636	503	311	237	201	144	92
3	.....	3900	2200	1400	949	611	487	302	230	196	140	88
$3\frac{1}{4}$	.....	3600	2000	1300	890	581	459	285	218	186	132	85
$3\frac{1}{2}$	.....	3400	1900	1200	837	548	433	270	208	177	126	82
$3\frac{3}{4}$	.....	3200	1800	1175	791	519	411	257	198	168	120	79
$3\frac{7}{8}$	.....	.....	.....	.....	.....	.....	395	250	195	165	119	.....
4	.....	3000	1700	1100	749	400	390	244	189	161	115	77
$4\frac{1}{4}$	.....	.....	1600	1050	700	.....	372	233	180	155	110	75
$4\frac{1}{2}$	.....	.....	1500	1000	650	.....	355	223	172	149	105	73
$4\frac{3}{4}$	.....	.....	1475	925	625	.....	339	214	166	143	101	71
5	.....	.....	1400	900	600	.....	325	205	160	136	97	69
$5\frac{1}{4}$	.....	.....	1350	850	575	.....	312	197	154	131	94	67
$5\frac{1}{2}$	.....	.....	1300	825	550	.....	300	190	149	127	91	65
$5\frac{3}{4}$	.....	.....	1250	775	525	.....	289	183	144	123	88	63
6	.....	.....	1200	750	500	.....	279	177	139	118	85	61
$6\frac{1}{4}$	.....	.....	.....	.....	.....	.....	.....	171	135	114	82	59
$6\frac{1}{2}$	.....	.....	.....	.....	.....	.....	.....	165	131	110	79	57
$6\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	160	127	107	77	55
7	.....	.....	.....	.....	.....	.....	.....	155	123	104	75	53
$7\frac{1}{4}$	.....	.....	.....	.....	.....	.....	.....	150	119	100	73	51
$7\frac{1}{2}$	.....	.....	.....	.....	.....	.....	.....	146	116	97	71	49
$7\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	142	113	94	69	47
8	.....	.....	.....	.....	.....	.....	.....	138	110	92	67	45

ESTIMATED WEIGHTS—Continued.

SQUARE HEAD MACHINE BOLTS—PER 100.

Diameter.....	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Length.												
1 1/2	3.5	6.3	9.3	14.1	20.	28.	35.	52.	82.	....	....	....
2	4.1	7.3	10.8	16.3	22.7	31.	38.5	57.	91.	....	....	....
2 1/2	4.8	8.3	12.3	18.3	25.3	34.3	42.6	63.	100.	....	....	....
3	5.3	9.3	13.7	20.4	28.	38.5	46.8	69.	108.	141.	204.	275.
3 1/2	5.9	10.3	15.1	22.4	30.6	42.8	50.9	76.	116.	152.	218.	292.
4	6.8	11.3	16.6	24.5	33.3	46.	55.	83.	125.	163.	232.	308.
4 1/2	7.3	12.3	18.	26.5	35.9	49.3	59.	90.	133.	174.	246.	324.
5	8.	13.4	19.5	28.6	38.6	52.5	63.3	97.	142.	185.	260.	340.
5 1/2	8.6	14.5	21.	30.6	41.3	56.8	67.5	103.	151.	196.	274.	356.
6	9.3	15.6	22.4	32.7	43.9	60.	71.8	109.	159.	206.	288.	372.
6 1/2	9.9	16.7	23.9	34.7	46.5	63.3	75.9	115.	168.	216.	302.	388.
7	10.5	17.8	25.5	36.8	49.2	66.5	79.	121.	176.	230.	316.	405.
7 1/2	11.2	18.9	27.2	38.8	51.8	69.8	83.	127.	184.	244.	330.	421.
8	11.9	20.	28.7	40.9	54.5	73.	92.	139.	202.	253.	344.	435.
9	....	....	31.7	45.	59.8	80.5	100.	151.	219.	271.	372.	473.
10	....	....	34.7	49.1	65.1	87.	105.	157.	227.	289.	400.	505.
11	....	....	37.7	53.2	70.4	91.3	110.	169.	244.	298.	414.	522.
12	....	....	40.7	57.3	75.7	98.8	120.	181.	261.	319.	442.	555.
13	....	....	....	....	81.	105.	130.	193.	278.	340.	470.	588.
14	....	....	....	....	86.3	111.	138.	205.	295.	361.	498.	620.
15	....	....	....	....	91.6	120.	147.	217.	312.	383.	526.	650.
16	....	....	....	....	96.9	127.	156.	229.	329.	404.	553.	680.
17	....	....	....	....	102.2	134.	164.	242.	346.	426.	577.	715.
18	....	....	....	....	107.5	140.	172.	254.	363.	448.	607.	750.
19	....	....	....	....	112.8	147.	180.	266.	380.	470.	635.	785.
20	....	....	....	....	118.1	154.	188.	279.	397.	492.	665.	820.
	....	....	....	....	....	....	....	....	....	513.	692.	855.

ESTIMATED WEIGHTS—Continued.**LAG SCREWS—PER 100.**

Diam...	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
Length.									
$1\frac{1}{2}$	$2\frac{3}{4}$	$4\frac{1}{2}$	7	10	....	....	....	....	....
2	$3\frac{1}{2}$	$5\frac{1}{2}$	$8\frac{1}{2}$	12	17	24	$27\frac{1}{2}$	....	....
$2\frac{1}{2}$	$4\frac{1}{4}$	$6\frac{1}{2}$	$9\frac{3}{4}$	14	19	26	31	....	....
3	$4\frac{3}{4}$	$7\frac{1}{2}$	11	16	21	28	34	51	....
$3\frac{1}{2}$	$5\frac{1}{4}$	$8\frac{1}{2}$	$12\frac{1}{2}$	18	24	31	38	55	....
4	$5\frac{3}{4}$	$9\frac{1}{2}$	14	20	26	34	42	60	85
$4\frac{1}{2}$	$6\frac{1}{2}$	$10\frac{1}{2}$	$15\frac{1}{2}$	22	28	37	46	65	91
5	7	$11\frac{1}{2}$	17	24	32	40	50	70	97
$5\frac{1}{2}$	$7\frac{1}{2}$	$12\frac{1}{2}$	$18\frac{1}{2}$	26	34	43	54	76	103
6	8	$13\frac{1}{2}$	20	28	36	46	58	81	110
$6\frac{1}{2}$	....	....	$21\frac{1}{2}$	30	38	49	62	86	117
7	....	....	23	32	41	52	65	92	125
$7\frac{1}{2}$	....	....	$24\frac{1}{2}$	34	44	55	69	97	132
8	....	....	26	36	47	58	73	103	140
$8\frac{1}{2}$	....	....	....	....	....	....	77	108	148
9	....	....	....	....	....	....	81	113	156
$9\frac{1}{2}$	....	....	....	....	....	....	85	118	164
10	....	....	....	....	....	....	89	123	172

CARRIAGE BOLTS—PER 100.

Diameter...	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$
Length.						
$1\frac{1}{2}$	3.4	6.2	9.	13.1	17.8	....
2	4.0	7.2	10.4	15.1	20.	37.2
$2\frac{1}{2}$	4.6	8.2	11.9	17.1	22.5	41.1
3	5.2	9.2	13.3	19.1	25.1	45.1
$3\frac{1}{2}$	5.7	10.1	14.8	21.1	27.6	49.1
4	6.6	11.2	16.2	23.1	30.2	53.
$4\frac{1}{2}$	7.2	12.3	17.6	25.1	32.7	57.
5	7.9	13.2	19.1	27.1	35.3	61.
$5\frac{1}{2}$	8.5	14.2	20.6	29.1	37.8	65.1
6	9.1	15.3	22.1	31.2	40.4	69.2
$6\frac{1}{2}$	9.7	16.4	23.6	33.1	43.	73.2
7	10.3	17.5	25.1	35.2	45.6	77.2
$7\frac{1}{2}$	....	18.5	26.6	37.2	48.2	81.3
8	....	19.5	28.1	39.3	50.8	85.3
$8\frac{1}{2}$	....	....	29.6	41.3	53.4	89.3
9	....	....	31.1	43.2	56.	93.3
$9\frac{1}{2}$	....	....	32.6	45.3	58.6	97.3
10	....	....	34.1	47.4	61.2	101.3
11	....	....	....	....	66.5	109.3
12	....	....	....	....	71.8	117.4
13	....	....	....	....	77.1	125.4
14	....	....	....	....	82.4	133.4
15	....	....	....	....	87.7	141.5
16	....	....	....	....	93.	149.6
17	....	....	....	....	98.3	157.6
18	....	....	....	....	103.6	165.7
19	....	....	....	....	108.4	173.7
20	....	....	....	....	114.2	181.8

USEFUL INFORMATION.

AVERAGE NUMBER OF NUTS IN KEQ. OF 200 POUNDS

Manufacturers' Standard Sizes.—Square Nuts.

Width	Thick- ness	Hole	No. in 200 lbs.	Width	Thick- ness	Hole	No. in 200 lbs.
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{7}{32}$	14,844	$1\frac{3}{4}$	$\frac{7}{8}$	$\frac{25}{32}$	326
$\frac{5}{8}$	$\frac{5}{16}$	$\frac{9}{32}$	7,880	$1\frac{3}{4}$	1	$\frac{7}{8}$	304
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{11}{32}$	4,440	2	1	$\frac{7}{8}$	224
$\frac{7}{8}$	$\frac{7}{16}$	$\frac{13}{32}$	2,732	2	$1\frac{1}{8}$	$\frac{13}{16}$	214
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{7}{16}$	2,450	$2\frac{1}{4}$	$1\frac{1}{8}$	$\frac{13}{16}$	152
1	$\frac{1}{2}$	$\frac{7}{16}$	1,816	$2\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{16}$	143
$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	1,390	$2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{16}$	108
$1\frac{1}{8}$	$\frac{5}{8}$	$\frac{9}{16}$	1,174	$2\frac{3}{4}$	$1\frac{3}{8}$	$1\frac{3}{16}$	83
$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{9}{16}$	898	3	$1\frac{1}{2}$	$1\frac{5}{16}$	65
$1\frac{3}{8}$	$\frac{3}{4}$	$\frac{21}{32}$	662	$3\frac{1}{4}$	$1\frac{5}{8}$	$1\frac{7}{16}$	51
$1\frac{1}{2}$	$\frac{3}{4}$	$\frac{21}{32}$	538	$3\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{9}{16}$	42
$1\frac{5}{8}$	$\frac{7}{8}$	$\frac{23}{32}$	392	$3\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{11}{16}$	32
				4	2	$1\frac{13}{16}$	27

Hexagon Nuts.

Width	Thick- ness	Hole	No. in 200 lbs.	Width	Thick- ness	Hole	No. in 200 lbs.
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{7}{32}$	17,332	$1\frac{5}{8}$	$\frac{7}{8}$	$\frac{23}{32}$	450
$\frac{5}{8}$	$\frac{5}{16}$	$\frac{9}{32}$	8,964	$1\frac{5}{8}$	1	$\frac{23}{32}$	428
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{11}{32}$	5,016	$1\frac{3}{4}$	1	$\frac{7}{8}$	372
$\frac{7}{8}$	$\frac{7}{16}$	$\frac{13}{32}$	2,988	$1\frac{3}{4}$	$1\frac{1}{8}$	$\frac{7}{8}$	336
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{7}{16}$	2,674	2	$1\frac{1}{4}$	$\frac{13}{16}$	211
1	$\frac{1}{2}$	$\frac{7}{16}$	2,160	$2\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{16}$	159
$1\frac{1}{8}$	$\frac{9}{16}$	$\frac{1}{2}$	1,445	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{16}$	119
$1\frac{1}{8}$	$\frac{5}{8}$	$\frac{9}{16}$	1,310	$2\frac{3}{4}$	$1\frac{5}{8}$	$1\frac{5}{16}$	88
$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{9}{16}$	1,028	3	$1\frac{3}{4}$	$1\frac{7}{16}$	69
$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{9}{16}$	920	$3\frac{1}{4}$	$1\frac{7}{8}$	$1\frac{9}{16}$	56
$1\frac{3}{8}$	$\frac{3}{4}$	$\frac{21}{32}$	752	$3\frac{1}{2}$	2	$1\frac{11}{16}$	43
$1\frac{1}{2}$	$\frac{7}{8}$	$\frac{23}{32}$	510	$3\frac{1}{2}$	2	$1\frac{13}{16}$	44
				4	2	$1\frac{15}{16}$	29

USEFUL INFORMATION.—Continued.**APPROXIMATE WEIGHT OF NUTS AND BOLT HEADS,
IN POUNDS.**

Diameter of Bolt in inches	Est. Wt. of Hexagon Nut and Head	Est. Wt. of Square Nut and Head	Diameter of Bolt in inches	Est. Wt. of Hexagon Nut and Head	Est. Wt. of Square Nut and Head
$\frac{1}{4}$	.017	.021	$\frac{7}{8}$	.73	.88
$\frac{5}{16}$	.042	.049	1	1.10	1.31
$\frac{3}{8}$	.057	.069	$1\frac{1}{4}$	2.14	2.56
$\frac{7}{16}$	.109	.120	$1\frac{1}{2}$	3.78	4.42
$\frac{1}{2}$	.128	.164	$1\frac{3}{4}$	5.6	7.0
$\frac{5}{8}$	.267	.320	2	8.75	10.5
$\frac{3}{4}$	.43	.55	$2\frac{1}{2}$	17.0	21.0

WASHERS IN A KEG OF 200 POUNDS.

Diameter	Size of Hole	Thickness Wire Gauge	Size of Bolt	Number
$\frac{9}{16}$	$\frac{1}{4}$	No. 18	$\frac{3}{16}$	88,150
$\frac{3}{4}$	$\frac{5}{16}$	" 16	$\frac{1}{4}$	27,690
$\frac{7}{8}$	$\frac{3}{8}$	" 16	$\frac{5}{16}$	22,440
1	$\frac{7}{16}$	" 14	$\frac{3}{8}$	13,146
$1\frac{1}{4}$	$\frac{1}{2}$	" 14	$\frac{7}{16}$	8,522
$1\frac{3}{8}$	$\frac{9}{16}$	" 12	$\frac{1}{2}$	5,366
$1\frac{1}{2}$	$\frac{5}{8}$	" 12	$\frac{9}{16}$	4,498
$1\frac{3}{4}$	$\frac{11}{16}$	" 10	$\frac{5}{8}$	2,630
2	$\frac{13}{16}$	" 10	$\frac{3}{4}$	2,026
$2\frac{1}{4}$	$\frac{15}{16}$	" 9	$\frac{7}{8}$	1,716
$2\frac{1}{2}$	$1\frac{1}{16}$	" 9	1	1,234
$2\frac{3}{4}$	$1\frac{1}{4}$	" 9	$1\frac{1}{8}$	1,032
3	$\frac{13}{8}$	" 9	$1\frac{1}{4}$	806
$3\frac{1}{4}$	$1\frac{1}{2}$	" 8	$1\frac{3}{8}$	640
$3\frac{1}{2}$	$1\frac{5}{8}$	" 8	$1\frac{1}{2}$	556

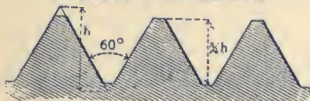
**STEEL BOAT SPIKES.
Number in 100 Pounds.**

Length	THICKNESS				
	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
3	1,500	.....	.....	.....	.....
$3\frac{1}{2}$	1,260	805	.....	.....	.....
4	1,100	756	.....	.....	.....
$4\frac{1}{2}$	976	710	.....	.....	.....
5	920	620	495	.....	.....
6	860	580	380	.....	.....
7	774	442	321	296	204
8	.....	423	303	256	170
9	.....	382	282	200	160
10	.....	.....	260	180	148
11	.....	.....	.....	166	135
12	.....	.....	.....	156	120

STANDARD SCREW THREADS, NUTS AND BOLT HEADS

Recommended by the Franklin Institute

SCREW THREADS



Angle of Thread 60°. Flat at Top and Bottom
— $\frac{1}{8}$ of Pitch.

Diameter of Screw, Inches	Diameter at Root of Thread, Inches	Threads per Inch, No.
$\frac{1}{4}$	.185	20
$\frac{5}{16}$	.240	18
$\frac{3}{8}$	.294	16
$\frac{7}{16}$	.344	14
$\frac{1}{2}$	.400	13
$\frac{9}{16}$	.454	12
$\frac{5}{8}$	.507	11
$\frac{3}{4}$	.620	10
$\frac{7}{8}$	.731	9
1	.837	8
$1\frac{1}{8}$	.940	7
$1\frac{1}{4}$	1.065	7
$1\frac{3}{8}$	1.160	6
$1\frac{1}{2}$	1.284	6
$1\frac{5}{8}$	1.389	$5\frac{1}{2}$
$1\frac{3}{4}$	1.490	5
$1\frac{7}{8}$	1.615	5
2	1.712	$4\frac{1}{2}$
$2\frac{1}{4}$	1.962	$4\frac{1}{2}$
$2\frac{1}{2}$	2.175	4
$2\frac{3}{4}$	2.425	4
3	2.629	$3\frac{1}{2}$
$3\frac{1}{4}$	2.879	$3\frac{1}{2}$
$3\frac{1}{2}$	3.100	$3\frac{1}{4}$
$3\frac{3}{4}$	3.317	3
4	3.567	3
$4\frac{1}{4}$	3.798	$2\frac{7}{8}$
$4\frac{1}{2}$	4.028	$2\frac{3}{4}$
$4\frac{3}{4}$	4.255	$2\frac{5}{8}$
5	4.480	$2\frac{1}{2}$
$5\frac{1}{4}$	4.730	$2\frac{1}{2}$
$5\frac{1}{2}$	4.953	$2\frac{3}{8}$
$5\frac{3}{4}$	5.203	$2\frac{3}{8}$
6	5.423	$2\frac{1}{4}$

Nuts and bolt heads are determined by the following rules which apply to both square and hexagon nuts:

Short dia. of rough nut

$$= 1\frac{1}{2} \times \text{dia. of bolt} + \frac{1}{8} \text{ in.}$$

Short dia. of finished nut

$$= 1\frac{1}{2} \times \text{dia. of bolt} + \frac{1}{16} \text{ in.}$$

Thickness of rough nut

$$= \text{dia. of bolt.}$$

Thickness of finished nut

$$= \text{dia. of bolt} + \frac{1}{16} \text{ in.}$$

Short dia. of rough head

$$= 1\frac{1}{2} \times \text{dia. of bolt} + \frac{1}{8} \text{ in.}$$

Short dia. of finished head

$$= 1\frac{1}{2} \times \text{dia. of bolt} + \frac{1}{16} \text{ in.}$$

Thickness of rough head

$$= \frac{1}{2} \text{ short dia. of head.}$$

Thickness of finished head

$$= \text{dia. of bolt} + \frac{1}{16} \text{ in.}$$

The long diameter of a hexagon nut may be obtained by multiplying the short diameter by 1.155 and the long diameter of a square nut by multiplying the short diameter by 1.414.

The above standards for screw threads, nuts and bolt heads were recommended by the Franklin Institute in December, 1864. The standard for screw threads has been very generally adopted in the United States, but the proportions recommended for nuts and bolt heads have not found general acceptance because of the odd sizes of bar—not usually rolled by the mills—required to make the nut.

UPSET SCREW ENDS FOR ROUND AND SQUARE BARS.

Diameter of Round or Side of Square Bar Inches	ROUND BARS				SQUARE BARS			
	Diam. of Upset Screw End Inches	Diam. of Screw at root of Thread Inches	Threads per Inch No.	Excess of Effective Area of Screw End Over Bar Per Cent	Diam. of Upset Screw End Inches	Diam. of Screw at root of Thread Inches	Threads per Inch No.	Excess of Effective Area of Screw End Over Bar Per Cent
$\frac{1}{2}$	$\frac{3}{4}$	.620	10	54	$\frac{3}{4}$	.620	10	21
$\frac{9}{16}$	$\frac{3}{4}$	.620	10	21	$\frac{7}{8}$	.731	9	33
$\frac{5}{8}$	$\frac{7}{8}$	.731	9	37	1	.837	8	41
$\frac{11}{16}$	1	.837	8	48	1	.837	8	17
$\frac{3}{4}$	1	.837	8	25	$1\frac{1}{8}$	.940	7	23
$\frac{13}{16}$	$1\frac{1}{8}$	.940	7	34	$1\frac{1}{4}$	1.065	7	35
$\frac{7}{8}$	$1\frac{1}{4}$	1.065	7	48	$1\frac{3}{8}$	1.160	6	38
$\frac{15}{16}$	$1\frac{1}{4}$	1.065	7	29	$1\frac{3}{8}$	1.160	6	20
1	$1\frac{3}{8}$	1.160	6	35	$1\frac{1}{2}$	1.284	6	29
$1\frac{1}{16}$	$1\frac{3}{8}$	1.160	6	19	$1\frac{5}{8}$	1.389	$5\frac{1}{2}$	34
$1\frac{1}{8}$	$1\frac{1}{2}$	1.284	6	30	$1\frac{5}{8}$	1.389	$5\frac{1}{2}$	20
$1\frac{3}{16}$	$1\frac{1}{2}$	1.284	6	17	$1\frac{3}{4}$	1.490	5	24
$1\frac{1}{4}$	$1\frac{5}{8}$	1.389	$5\frac{1}{2}$	23	$1\frac{7}{8}$	1.615	5	31
$1\frac{5}{16}$	$1\frac{3}{4}$	1.490	5	29	$1\frac{7}{8}$	1.615	5	19
$1\frac{3}{8}$	$1\frac{3}{4}$	1.490	5	18	2	1.712	$4\frac{1}{2}$	22
$1\frac{7}{16}$	$1\frac{7}{8}$	1.615	5	26	$2\frac{1}{8}$	1.837	$4\frac{1}{2}$	28
$1\frac{1}{2}$	2	1.712	$4\frac{1}{2}$	30	$2\frac{1}{8}$	1.837	$4\frac{1}{2}$	18
$1\frac{9}{16}$	2	1.712	$4\frac{1}{2}$	20	$2\frac{1}{4}$	1.962	$4\frac{1}{2}$	24
$1\frac{5}{8}$	$2\frac{1}{8}$	1.837	$4\frac{1}{2}$	28	$2\frac{3}{8}$	2.087	$4\frac{1}{2}$	30
$1\frac{11}{16}$	$2\frac{1}{8}$	1.837	$4\frac{1}{2}$	18	$2\frac{3}{8}$	2.087	$4\frac{1}{2}$	20
$1\frac{3}{4}$	$2\frac{1}{4}$	1.962	$4\frac{1}{2}$	26	$2\frac{1}{2}$	2.175	4	21
$1\frac{13}{16}$	$2\frac{1}{4}$	1.962	$4\frac{1}{2}$	17	$2\frac{5}{8}$	2.300	4	26
$1\frac{7}{8}$	$2\frac{3}{8}$	2.087	$4\frac{1}{2}$	24	$2\frac{5}{8}$	2.300	4	18
$1\frac{15}{16}$	$2\frac{1}{2}$	2.175	4	26	$2\frac{3}{4}$	2.425	4	23
2	$2\frac{1}{2}$	2.175	4	18	$2\frac{7}{8}$	2.550	4	28
$2\frac{1}{16}$	$2\frac{5}{8}$	2.300	4	24	$2\frac{7}{8}$	2.550	4	20
$2\frac{1}{8}$	$2\frac{5}{8}$	2.300	4	17	3	2.629	$3\frac{1}{2}$	20
$2\frac{3}{16}$	$2\frac{3}{4}$	2.425	4	23	$3\frac{1}{8}$	2.754	$3\frac{1}{2}$	24

Decimals of a Foot for Each 1-64th of an Inch.

Inch	0"	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"
0	0	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167
1-64	.0013	.0846	.1680	.2513	.3346	.4180	.5013	.5846	.6680	.7513	.8346	.9180
1-32	.0026	.0859	.1693	.2526	.3359	.4193	.5026	.5859	.6693	.7526	.8359	.9193
3-64	.0039	.0872	.1706	.2539	.3372	.4206	.5039	.5872	.6706	.7539	.8372	.9206
1-16	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219
5-64	.0065	.0898	.1732	.2565	.3398	.4232	.5065	.5898	.6732	.7565	.8398	.9232
3-32	.0078	.0911	.1745	.2578	.3411	.4245	.5078	.5911	.6745	.7578	.8411	.9245
7-64	.0091	.0924	.1758	.2591	.3424	.4258	.5091	.5924	.6758	.7591	.8424	.9258
1-8	.0104	.0937	.1771	.2604	.3437	.4271	.5104	.5937	.6771	.7604	.8437	.9271
9-64	.0117	.0951	.1784	.2617	.3451	.4284	.5117	.5951	.6784	.7617	.8451	.9284
5-32	.0130	.0964	.1797	.2630	.3464	.4297	.5130	.5964	.6797	.7630	.8464	.9297
11-64	.0143	.0977	.1810	.2643	.3477	.4310	.5143	.5977	.6810	.7643	.8477	.9310
3-16	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323
13-64	.0169	.1003	.1836	.2669	.3503	.4336	.5169	.6003	.6836	.7669	.8503	.9336
7-32	.0182	.1016	.1849	.2682	.3516	.4349	.5182	.6016	.6849	.7682	.8516	.9349
15-64	.0195	.1029	.1862	.2695	.3529	.4362	.5195	.6029	.6862	.7695	.8529	.9362
1-4	.0208	.1042	.1875	.2708	.3542	.4375	.5206	.6042	.6875	.7708	.8542	.9375
17-64	.0221	.1055	.1888	.2721	.3555	.4388	.5221	.6055	.6888	.7721	.8555	.9388
9-32	.0234	.1068	.1901	.2734	.3568	.4401	.5234	.6068	.6901	.7734	.8568	.9401
19-64	.0247	.1081	.1914	.2747	.3581	.4414	.5247	.6081	.6914	.7747	.8581	.9414
5-16	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427
21-64	.0273	.1107	.1940	.2773	.3607	.4440	.5273	.6107	.6940	.7773	.8607	.9440
11-32	.0286	.1120	.1953	.2786	.3620	.4453	.5286	.6120	.6953	.7786	.8620	.9453
23-64	.0299	.1133	.1966	.2799	.3633	.4466	.5299	.6133	.6966	.7799	.8633	.9466
3-8	.0312	.1146	.1979	.2812	.3646	.4479	.5312	.6146	.6979	.7812	.8646	.9479
25-64	.0326	.1159	.1992	.2826	.3659	.4492	.5326	.6159	.6992	.7826	.8659	.9492
13-32	.0339	.1172	.2005	.2839	.3672	.4505	.5339	.6172	.7005	.7839	.8672	.9505
27-64	.0352	.1185	.2018	.2852	.3685	.4518	.5352	.6185	.7018	.7852	.8685	.9518
7-16	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531
29-64	.0378	.1211	.2044	.2878	.3711	.4544	.5378	.6211	.7044	.7878	.8711	.9544
15-32	.0391	.1224	.2057	.2891	.3724	.4557	.5391	.6224	.7057	.7891	.8724	.9557
31-64	.0404	.1237	.2070	.2904	.3737	.4570	.5404	.6237	.7070	.7904	.8737	.9570
1-2	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583
33-64	.0430	.1263	.2096	.2930	.3763	.4596	.5430	.6263	.7096	.7930	.8763	.9596
17-32	.0443	.1276	.2109	.2943	.3776	.4609	.5443	.6276	.7109	.7943	.8776	.9609
35-64	.0456	.1289	.2122	.2956	.3789	.4622	.5456	.6289	.7122	.7956	.8789	.9622
9-16	.0469	.1302	.2135	.2969	.3802	.4635	.5469	.6302	.7135	.7969	.8802	.9635
37-64	.0482	.1315	.2143	.2982	.3815	.4648	.5482	.6315	.7148	.7982	.8815	.9648
19-32	.0495	.1328	.2161	.2995	.3828	.4661	.5495	.6328	.7161	.7995	.8828	.9661
39-64	.0508	.1341	.2174	.3008	.3841	.4674	.5508	.6341	.7174	.8008	.8841	.9674
5-8	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688
41-64	.0534	.1367	.2201	.3034	.3867	.4701	.5534	.6367	.7201	.8034	.8867	.9701
21-32	.0547	.1380	.2214	.3047	.3880	.4714	.5547	.6380	.7214	.8047	.8880	.9714
43-64	.0560	.1393	.2227	.3060	.3893	.4727	.5560	.6393	.7227	.8060	.8893	.9727
11-16	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740
45-64	.0586	.1419	.2253	.3086	.3919	.4753	.5586	.6419	.7253	.8086	.8919	.9753
23-32	.0599	.1432	.2266	.3099	.3932	.4766	.5599	.6432	.7266	.8099	.8932	.9766
47-64	.0612	.1445	.2279	.3112	.3945	.4779	.5612	.6445	.7279	.8112	.8945	.9779
3-4	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792
49-64	.0638	.1471	.2305	.3138	.3971	.4805	.5638	.6471	.7305	.8138	.8971	.9805
25-32	.0651	.1484	.2318	.3151	.3984	.4818	.5651	.6484	.7318	.8151	.8984	.9818
51-64	.0664	.1497	.2331	.3164	.3997	.4831	.5664	.6497	.7331	.8164	.8997	.9831
13-16	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844
53-64	.0690	.1523	.2357	.3190	.4023	.4857	.5690	.6523	.7357	.8190	.9023	.9857
27-32	.0703	.1536	.2370	.3203	.4036	.4870	.5703	.6536	.7370	.8203	.9036	.9870
55-64	.0716	.1549	.2383	.3216	.4049	.4883	.5716	.6549	.7383	.8216	.9049	.9883
7-8	.0729	.1562	.2396	.3229	.4062	.4896	.5729	.6562	.7396	.8229	.9062	.9896
57-64	.0742	.1576	.2409	.3242	.4076	.4909	.5742	.6576	.7409	.8242	.9076	.9909
29-32	.0755	.1589	.2422	.3255	.4089	.4922	.5755	.6589	.7422	.8255	.9089	.9922
59-64	.0768	.1602	.2435	.3268	.4102	.4935	.5768	.6602	.7435	.8268	.9102	.9935
15-16	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948
61-64	.0794	.1628	.2461	.3294	.4128	.4961	.5794	.6628	.7461	.8294	.9128	.9961
31-32	.0807	.1641	.2474	.3307	.4141	.4974	.5807	.6641	.7474	.8307	.9141	.9974
63-64	.0820	.1654	.2487	.3320	.4154	.4987	.5820	.6654	.7487	.8320	.9154	.9987

CIRCUMFERENCES AND AREAS OF CIRCLES.**OF ONE INCH.**

Fract.	Dec.	Circ.	Area
1-64	.015625	.04909	.00019
1-32	.03125	.09818	.00077
3-64	.046875	.14726	.00173
1-16	.0625	.19635	.00307
5-64	.078125	.24545	.00479
3-32	.09375	.29452	.00690
7-64	.109375	.34363	.00939
1-8	.125	.39270	.01227
9-64	.140625	.44181	.01553
5-32	.15625	.49087	.01917
11-64	.171875	.53999	.02320
3-16	.1875	.58905	.02761
13-64	.203125	.63817	.03241
7-32	.21875	.68722	.03758
15-64	.234375	.73635	.04314
1-4	.25	.78540	.04909
17-64	.265625	.83453	.05542
9-32	.28125	.88357	.06213
19-64	.296875	.93271	.06922
5-16	.3125	.98175	.07670
21-64	.328125	1.03090	.08456
11-32	.34375	1.07999	.09281
23-64	.359375	1.1291	.10144
3-8	.375	1.1781	.11045
25-64	.390625	1.2273	.11984
13-32	.40625	1.2763	.12962
27-64	.421875	1.3254	.13979
7-16	.4375	1.3744	.15033
29-64	.453125	1.4236	.16126
15-32	.46875	1.4726	.17257
31-64	.484375	1.5218	.18427
1-2	.5	1.5708	.19635
33-64	.515625	1.6199	.20880
17-32	.53125	1.6690	.22166
35-64	.546875	1.7181	.23489
9-16	.5625	1.7671	.24850
37-64	.578125	1.8163	.26248
19-32	.59375	1.8653	.27688
39-64	.609375	1.9145	.29164
5-8	.625	1.9635	.30680
41-64	.640625	2.0127	.32232
21-32	.65625	2.0617	.33824
43-64	.671875	2.1108	.35453
11-16	.6875	2.1598	.37122
45-64	.703125	2.2090	.38828
23-32	.71875	2.2580	.40574
47-64	.734375	2.3072	.42356
3-4	.75	2.3562	.44179
49-64	.765625	2.4054	.45253
25-32	.78125	2.4544	.47937
51-64	.796875	2.5036	.49872
13-16	.8125	2.5525	.51849
53-64	.828125	2.6017	.53862
27-32	.84375	2.6507	.55914
55-64	.859375	2.6999	.58008
7-8	.875	2.7489	.60132
57-64	.890625	2.7981	.62298
29-32	.90625	2.8471	.64504
59-64	.921875	2.8963	.66746
15-16	.9375	2.9452	.69029
61-64	.953125	2.9945	.71349
31-32	.96875	3.0434	.73708
63-64	.984375	3.0928	.76097

OF INCHES OR FEET.

Dia	Circ.	Area.	Dia	Circ.	Area.
1	3.1416	.7854	64	201.06	3216.99
2	6.2832	3.1416	65	204.20	3318.31
3	9.4248	7.0686	66	207.34	3421.19
4	12.5664	12.5664	67	210.49	3525.65
5	15.7080	19.635	68	213.63	3631.68
6	18.850	28.274	69	216.77	3739.28
7	21.991	38.485	70	219.91	3848.45
8	25.133	50.266	71	223.05	3959.19
9	28.274	63.617	72	226.19	4071.50
10	31.416	78.540	73	229.34	4185.39
11	34.558	95.033	74	232.48	4300.84
12	37.699	113.1	75	235.62	4417.86
13	40.841	132.73	76	238.76	4536.46
14	43.982	153.94	77	241.90	4656.63
15	47.124	176.71	78	245.04	4778.36
16	50.265	201.06	79	248.19	4901.07
17	53.407	226.98	80	251.33	5026.55
18	56.549	254.47	81	254.47	5153.
19	59.690	283.53	82	257.61	5281.02
20	62.832	314.16	83	260.75	5410.61
21	65.973	346.36	84	263.89	5541.77
22	69.115	380.13	85	267.04	5674.50
23	72.257	415.48	86	270.18	5808.80
24	75.398	452.39	87	273.32	5944.68
25	78.540	490.87	88	276.46	6082.12
26	81.681	530.93	89	279.60	6221.14
27	84.823	572.56	90	282.74	6361.73
28	87.965	615.75	91	285.88	6503.88
29	91.106	660.52	92	289.03	6647.61
30	94.248	706.86	93	292.17	6792.91
31	97.389	754.77	94	295.31	6939.78
32	100.53	804.25	95	298.45	7088.22
33	103.67	855.30	96	301.59	7238.23
34	106.81	907.92	97	304.73	7389.81
35	109.96	962.11	98	307.88	7542.96
36	113.10	1017.88	99	311.02	7697.69
37	116.24	1075.21	100	314.16	7853.98
38	119.38	1134.11	101	317.30	8011.85
39	122.52	1194.59	102	320.44	8171.28
40	125.66	1256.64	103	323.58	8332.29
41	128.81	1320.25	104	326.73	8494.87
42	131.95	1385.44	105	329.87	8659.01
43	135.09	1452.20	106	333.01	8824.73
44	138.23	1520.53	107	336.15	8992.02
45	141.37	1590.43	108	339.29	9160.88
46	144.51	1661.90	109	342.43	9331.32
47	147.65	1734.94	110	345.58	9503.32
48	150.80	1809.56	111	348.72	9676.89
49	153.94	1885.74	112	351.86	9852.03
50	157.08	1963.50	113	355.	10028.75
51	160.22	2042.82	114	358.14	10207.03
52	163.36	2123.72	115	361.28	10386.89
53	166.50	2206.18	116	364.42	10568.32
54	169.65	2290.22	117	367.57	10751.32
55	172.79	2375.83	118	370.71	10935.88
56	175.93	2463.01	119	373.85	11122.02
57	179.07	2551.76	120	376.99	11309.73
58	182.21	2642.08	121	380.13	11499.01
59	185.35	2733.97	122	383.27	11689.87
60	188.50	2827.43	123	386.42	11882.29
61	191.64	2922.47	124	389.56	12076.28
62	194.78	3019.07	125	392.70	12271.85
63	197.92	3117.25	126	395.84	12468.98

NUMBER OF U. S. GALLONS IN RECTANGULAR TANKS.

For One Foot in depth.

[illegible]

U. S. GALLONS IN ROUND TANKS.

For One Foot in Depth.

Dia. of Tanks.	No. U. S. Gals.	Cubic Ft. and Area in Sq. Ft.	Dia. of Tanks.	No. U. S. Gals.	Cubic Ft. and Area in Sq. Ft.	Dia. of Tanks.	No. U. S. Gals.	Cubic Ft. and Area in Sq. Ft.
1 ft.	5.87	.785	5 ft. 8 in.	188.66	25.22	19 ft.	2120.90	283.53
1 1 in.	6.89	.922	5 9	194.25	25.97	19 3 in.	2177.10	291.04
1 2	8.	1.069	5 10	199.92	26.73	19 6	2234.	298.65
1 3	9.18	1.227	5 11	205.67	27.49	19 9	2291.70	306.35
1 4	10.44	1.396	6	211.51	28.27	20	2350.10	314.16
1 5	11.79	1.576	6 3	229.50	30.68	20 3	2409.20	322.06
1 6	13.22	1.767	6 6	248.23	33.18	20 6	2469.10	330.06
1 7	14.73	1.969	6 9	267.69	35.78	20 9	2529.60	338.16
1 8	16.32	2.182	7	287.88	38.48	21	2591.	346.36
1 9	17.99	2.405	7 3	308.81	41.28	21 3	2653.	354.66
1 10	19.75	2.640	7 6	330.48	44.18	21 6	2715.80	363.05
1 11	21.58	2.885	7 9	352.88	47.17	21 9	2779.30	371.54
2	23.50	3.142	8	376.01	50.27	22	2843.60	380.13
2 1	25.50	3.409	8 3	399.88	53.46	22 3	2908.60	388.82
2 2	27.58	3.687	8 6	424.48	56.75	22 6	2974.30	397.61
2 3	29.74	3.976	8 9	449.82	60.13	22 9	3040.80	406.49
2 4	31.99	4.276	9	475.89	63.62	23	3108.	415.48
2 5	34.31	4.587	9 3	502.70	67.20	23 3	3175.90	424.56
2 6	36.72	4.909	9 6	530.24	70.88	23 6	3244.60	433.74
2 7	39.21	5.241	9 9	558.51	74.66	23 9	3314.	443.01
2 8	41.78	5.585	10	587.52	78.54	24	3384.10	452.39
2 9	44.43	5.940	10 3	617.26	82.52	24 3	3455.	461.86
2 10	47.16	6.305	10 6	640.74	86.59	24 6	3526.60	471.44
2 11	49.98	6.681	10 9	678.95	90.76	24 9	3598.90	481.11
3	52.88	7.069	11	710.90	95.03	25	3672.	490.87
3 1	55.86	7.467	11 3	743.58	99.40	25 3	3745.80	500.74
3 2	58.92	7.876	11 6	776.99	103.87	25 6	3820.30	510.71
3 3	62.06	8.296	11 9	811.14	108.43	25 9	3895.60	520.77
3 4	65.28	8.727	12	846.03	113.10	26	3971.60	530.93
3 5	68.58	9.168	12 3	881.65	117.86	26 3	4048.40	541.19
3 6	71.97	9.621	12 6	918.	122.72	26 6	4125.90	551.55
3 7	75.44	10.085	12 9	955.09	127.68	26 9	4204.10	562.
3 8	78.99	10.559	13	992.91	132.73	27	4283.	572.66
3 9	82.62	11.045	13 3	1031.50	137.89	27 3	4362.70	583.21
3 10	86.33	11.541	13 6	1070.80	143.14	27 6	4443.10	593.96
3 11	90.13	12.048	13 9	1110.80	148.49	27 9	4524.30	604.81
4	94.	12.566	14	1151.50	153.94	28	4606.20	615.75
4 1	97.96	13.095	14 3	1193.	159.48	28 3	4688.80	626.80
4 2	102.	13.635	14 6	1235.30	165.13	28 6	4772.10	637.94
4 3	106.12	14.186	14 9	1278.20	170.87	28 9	4856.20	649.18
4 4	110.32	14.748	15	1321.90	176.71	29	4941.	660.52
4 5	114.61	15.321	15 3	1366.40	182.65	29 3	5026.60	671.96
4 6	118.97	15.90	15 6	1411.50	188.69	29 6	5112.90	683.49
4 7	123.42	16.50	15 9	1457.40	194.83	29 9	5199.90	695.13
4 8	127.95	17.10	16	1504.10	201.06	30	5287.70	706.86
4 9	132.56	17.72	16 3	1551.40	207.39	30 3	5376.20	718.69
4 10	137.25	18.35	16 6	1599.50	213.82	30 6	5465.40	730.62
4 11	142.02	18.99	16 9	1648.40	220.35	30 9	5555.40	742.74
5	146.88	19.63	17	1697.90	226.98	31	5646.10	754.77
5 1	151.82	20.29	17 3	1748.20	233.71	31 3	5737.50	766.99
5 2	156.83	20.97	17 6	1799.30	240.53	31 6	5829.70	779.31
5 3	161.93	21.65	17 9	1851.10	247.45	31 9	5922.60	791.73
5 4	167.12	22.34	18	1903.60	254.47	32	6016.20	804.25
5 5	172.38	23.04	18 3	1956.80	261.59	32 3	6110.60	816.86
5 6	177.72	23.76	18 6	2010.80	268.80	32 6	6205.70	829.58
5 7	183.15	24.48	18 9	2065.50	276.12	32 9	6301.50	842.39

31½ Gallons equals 1 Barrel.

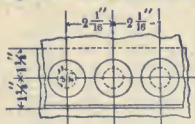
To find the capacity of tanks greater than the largest given in the table, look in the table for a Tank of one-half of the given size and multiply its capacity by 4, or one of one-third its size and multiply its capacity by 9, etc.

SINGLE RIVETED GIRTH JOINTS.

Designed and advocated by Hartford Steam Boiler Inspection and Insurance Co.

FOR BOILER 1-4 IN. THICK

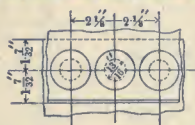
When longit'l seams are Double Riveted.



Rivets $\frac{1}{2}$ in. diameter.

FOR BOILER 5-16 IN. THICK

When longit'l seams are Double Riveted.



Rivets $\frac{3}{4}$ in. diameter.

FOR BOILER 3-8 IN. THICK

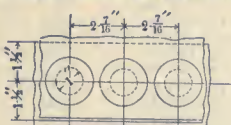
When longit'l seams are Double Riveted.



Rivets $\frac{3}{4}$ in. diameter.

FOR BOILER 7-16 IN. THICK

When longit'l seams are Double Riveted.



Rivets $\frac{1}{2}$ in. diameter.

FOR BOILER 1-2 IN. THICK

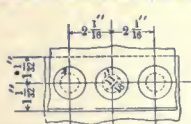
When longit'l seams are Double Riveted.



Rivets 1 in. diameter.

FOR BOILER 1-4 IN. THICK

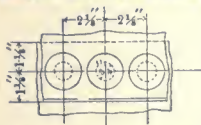
When longit'l seams are Triple Riveted.



Rivets $\frac{1}{2}$ in. diameter.

FOR BOILER 5-16 IN. THICK

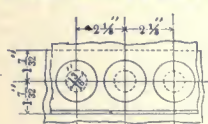
When longit'l seams are Triple Riveted.



Rivets $\frac{3}{4}$ in. diameter.

FOR BOILER 3-8 IN. THICK

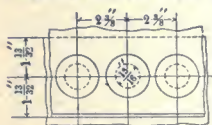
When longit'l seams are Triple Riveted.



Rivets $\frac{3}{4}$ in. diameter.

FOR BOILER 7-16 IN. THICK

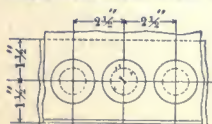
When longit'l seams are Triple Riveted.



Rivets $\frac{1}{2}$ in. diameter.

FOR BOILER 1-2 IN. THICK

When longit'l seams are Triple Riveted.

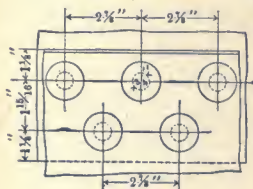


Rivets $\frac{1}{2}$ in. diameter.

See pages 295 to 298 inclusive for details of Longitudinal Seams.

LONGITUDINAL RIVETED JOINTS.

Designed and advocated by Hartford Steam Boiler Inspection and Insurance Co.

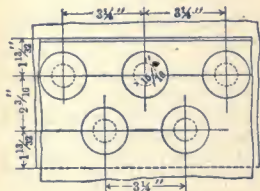
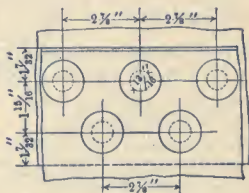


DOUBLE RIVETED LAP JOINT FOR 1-4 IN. PLATES.

Holes $\frac{3}{4}$ inch diameter.
Rivets $\frac{1}{2}$ inch diameter.
Efficiency = $\frac{74}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.

DOUBLE RIVETED LAP JOINT FOR 5-16 IN. PLATES.

Holes $1\frac{1}{8}$ inch diameter.
Rivets $\frac{3}{4}$ inch diameter.
Efficiency = $\frac{72}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.

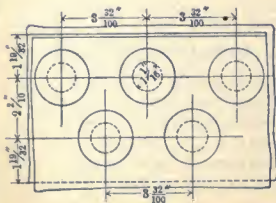
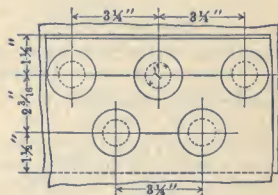


DOUBLE RIVETED LAP JOINT FOR 3-8 IN. PLATES.

Holes $1\frac{1}{8}$ inch diameter.
Rivets $\frac{3}{4}$ inch diameter.
Efficiency = $\frac{70}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.

DOUBLE RIVETED LAP JOINT FOR 7-16 IN. PLATES.

Holes 1 inch diameter.
Rivets $1\frac{1}{8}$ inch diameter.
Efficiency = $\frac{70}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.



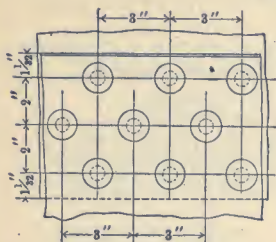
DOUBLE RIVETED LAP JOINT FOR 1-2 IN. PLATES.

Holes $1\frac{1}{8}$ inch diameter.
Rivets 1 inch diameter.
Efficiency = $\frac{68}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.

See page 294 for details of Girth Joints.

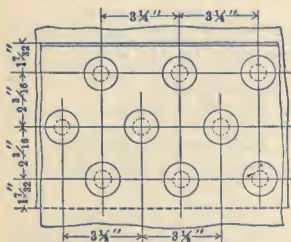
LONGITUDINAL RIVETED JOINTS—Continued

Designed and advocated by Hartford Steam Boiler Inspection and Insurance Co.



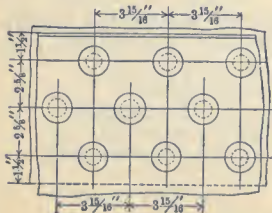
**TRIPLE RIVETED LAP JOINT
FOR 5-16 IN. PLATES.**

Holes $\frac{3}{4}$ inch diameter.
Rivets $\frac{11}{16}$ inch diameter.
Efficiency = $\frac{7.6}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.



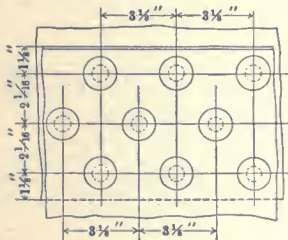
**TRIPLE RIVETED LAP JOINT
FOR 7-16 IN. PLATES.**

Holes $\frac{1}{2}$ inch diameter.
Rivets $\frac{7}{8}$ inch diameter.
Efficiency = $\frac{7.5}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.



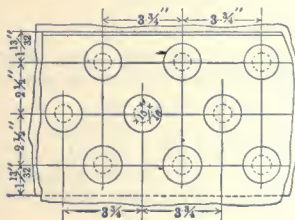
**TRIPLE RIVETED LAP JOINT
FOR 1-4 IN. PLATES.**

Holes $\frac{11}{16}$ inch diameter.
Rivets $\frac{5}{8}$ inch diameter.
Efficiency = $\frac{7.7}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.



**TRIPLE RIVETED LAP JOINT
FOR 3-8 IN. PLATES.**

Holes $\frac{1}{2}$ inch diameter.
Rivets $\frac{3}{4}$ inch diameter.
Efficiency = $\frac{7.5}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.



**TRIPLE RIVETED LAP JOINT
FOR 1-2 IN. PLATES.**

Holes 1 inch diameter.
Rivets $\frac{1}{2}$ inch diameter.
Efficiency = $\frac{7.5}{100}$ of solid plate.
Tensile Strength 60,000 pounds.
Shearing Strength 38,000 pounds.

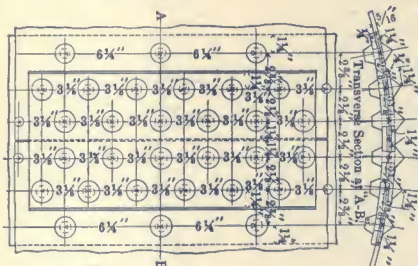
See page 292 for details of Girth Joints.

LONGITUDINAL RIVETED JOINTS—Continued

Designed and advocated by Hartford Steam Boiler Inspection and Insurance Co.

TRIPLE RIVETED BUTT JOINT FOR 5-16 IN. PLATES.

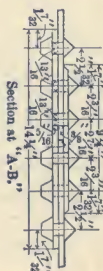
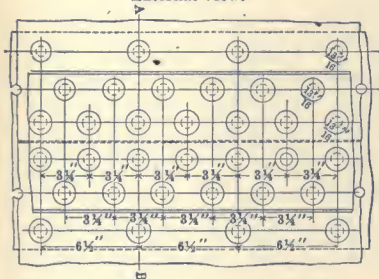
External View.



Holes $\frac{3}{4}$ in. dia.
Rivets $1\frac{1}{8}$ in. dia.
Efficiency 88%.

TRIPLE RIVETED BUTT JOINT FOR 3-8 IN. PLATES.

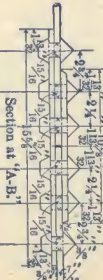
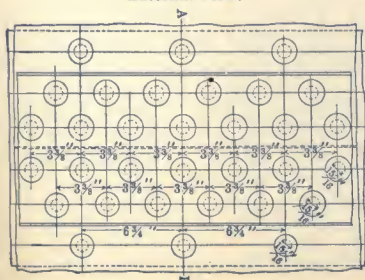
External View.



Holes $1\frac{3}{8}$ in. dia.
Rivets $\frac{3}{4}$ in. dia.
Efficiency 87.5%.

TRIPLE RIVETED BUTT JOINT FOR 7-16 IN. PLATES.

External View.



Holes $1\frac{5}{8}$ in. dia.
Rivets $\frac{7}{8}$ in. dia.
Efficiency 86%.

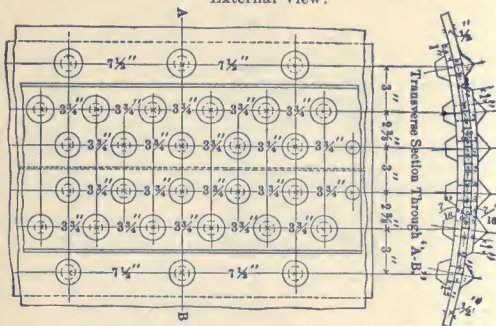
See page 294 for details of Girth Joints.

LONGITUDINAL RIVETED JOINTS.—Continued.

Designed and advocated by Hartford Steam Boiler Inspection and Insurance Co.

TRIPLE RIVETED BUTT JOINT FOR 1-2 IN. PLATES.

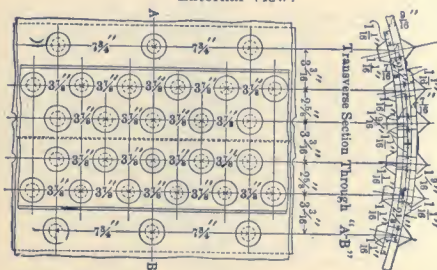
External View.



Holes 1 in. dia.
Rivets $1\frac{1}{8}$ in. dia.
Efficiency 86.6%.

TRIPLE RIVETED BUTT JOINT FOR 9-16 IN. PLATES.

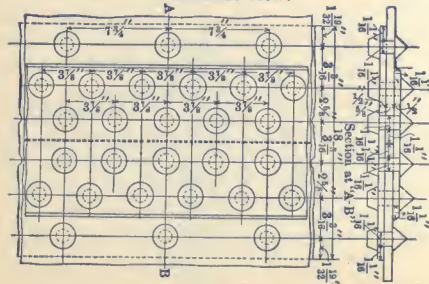
External View.



Holes $1\frac{1}{8}$ in. dia.
Rivets 1 in. dia.
Efficiency 85.4%.

TRIPLE RIVETED BUTT JOINT FOR 5-8 IN. PLATES.

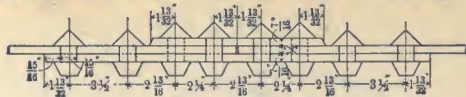
External View.



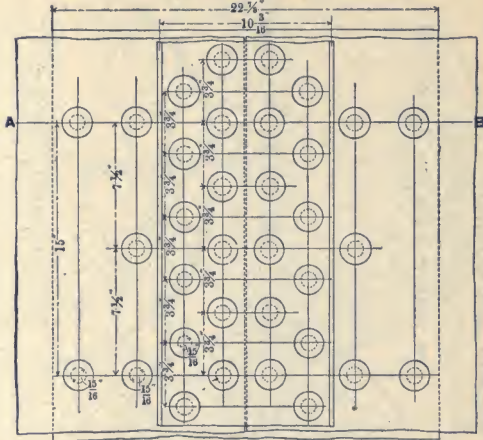
Holes $1\frac{1}{8}$ in. dia.
Rivets 1 in. dia.
Efficiency 84%.

See page 294 for details of Girth Joints.

QUADRUPLE RIVETED BUTT JOINTS FOR 1-2 IN. PLATE.

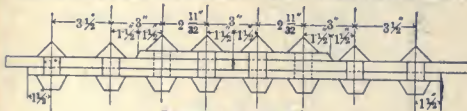


SECTION AT "A-B"

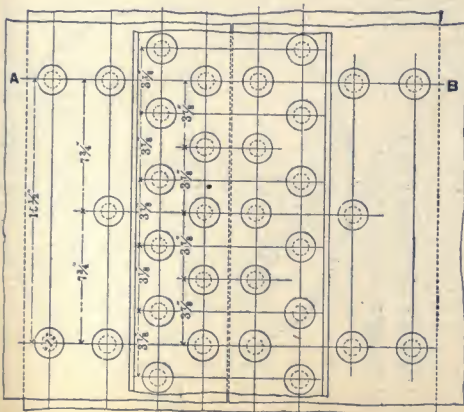


EXTERNAL VIEW

QUADRUPLE RIVETED BUTT JOINTS FOR 5-8 IN. PLATE.



SECTION AT "A-B"



EXTERNAL VIEW

Holes $1\frac{5}{8}$ in. dia.

Rivets $\frac{7}{8}$ in. dia.

Efficiency 94%.

Holes 1 in. dia.

Rivets $1\frac{5}{8}$ in. dia.

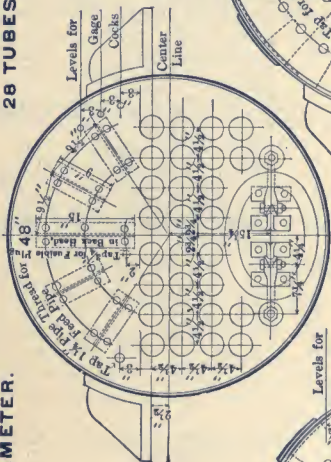
Efficiency 93.5%.

FLUE SPACING AND HEAD BRACING.

Designed and advocated by Hartford Steam Boiler Inspection and Insurance Co.

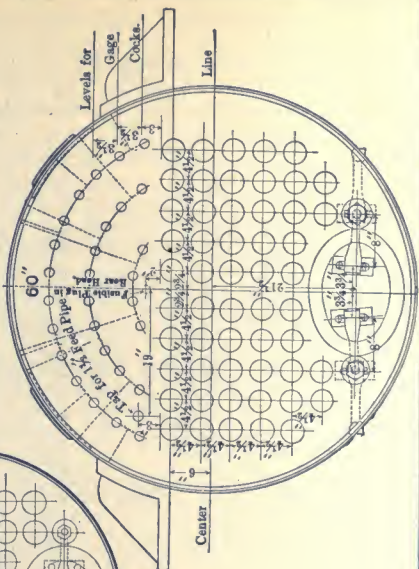
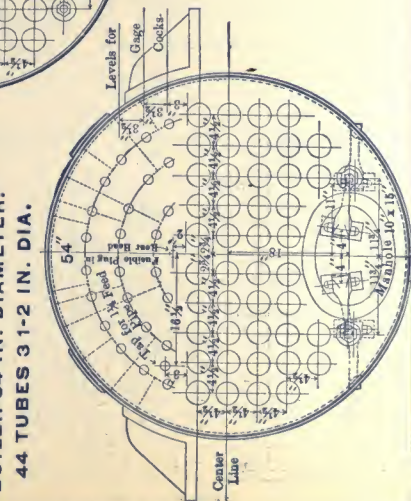
BOILER 48 IN. DIAMETER.

28 TUBES 3 1-2 IN. DIAMETER.



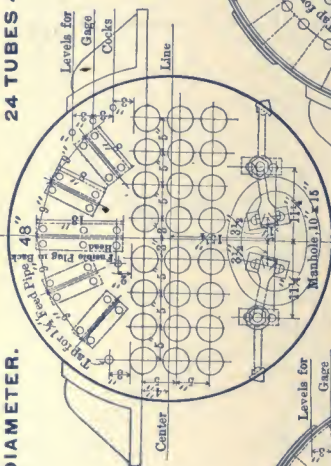
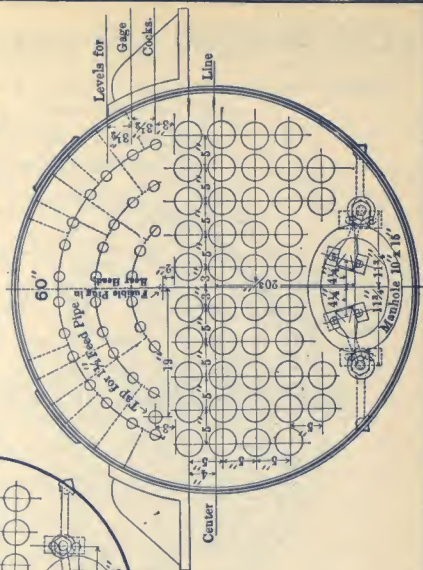
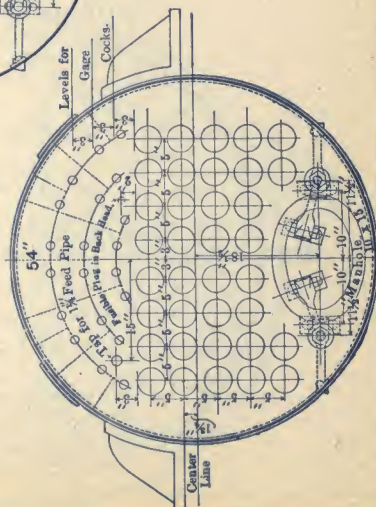
BOILER 60 IN. DIAMETER.
54 TUBES 3 1-2 IN. DIA.

BOILER 54 IN. DIAMETER.
44 TUBES 3 1-2 IN. DIA.



FLUE SPACING AND HEAD BRACING—Continued.

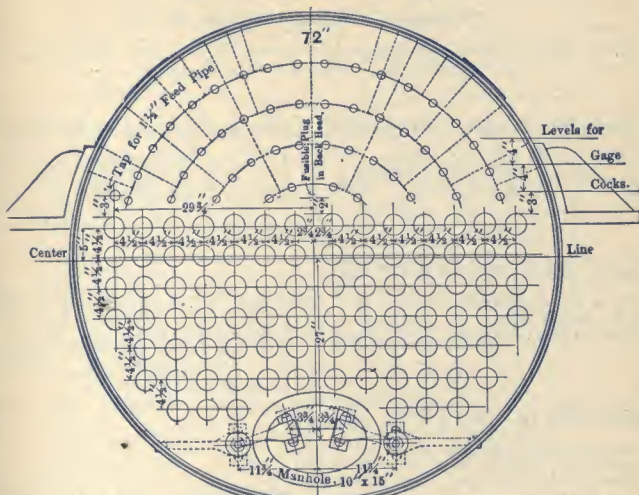
Designed and advocated by Hartford Steam Boiler Inspection and Insurance Co.

BOILER 48 IN. DIAMETER.**24 TUBES 4 IN. DIAMETER.****BOILER 60 IN. DIAMETER.
44 TUBES 4 IN. DIA.****BOILER 54 IN. DIAMETER.
36 TUBES 4 IN. DIA.**

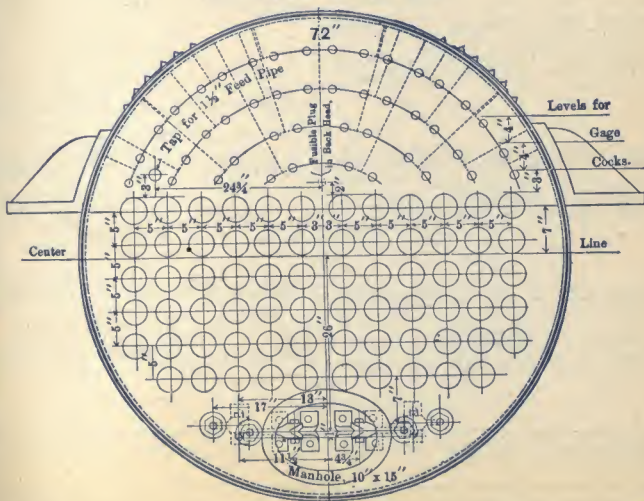
FLUE SPACING AND HEAD BRACING—Contd.

Designed and advocated by Hartford Steam Boiler Inspection and Insurance Co.

**BOILER 72 IN. DIAMETER.
86 TUBES $3\frac{1}{2}$ IN. DIA.**



**BOILER 72 IN. DIAMETER.
70 TUBES 4 IN. DIA.**



STOCK BOILERS.LIST OF
PLATES AND HEADS**FLANGE STEEL, 60,000 T. S.**

Kept in stock for standard sizes of tubular boilers, from 30 to 72 in. dia. From six to twelve boilers of each variety carried in stock.

Shell, 30 in. dia. x 6 ft. long

2 Sh'ts $\frac{1}{4}$ x 36 x 98	} Flange Steel.
1 $\frac{1}{4}$ x 72 x 98	
2 Hds. 34 dia. x 5-16 or $\frac{3}{8}$	

Shell, 30 in. dia. x 8 ft. long

2 Sh'ts $\frac{1}{4}$ or 5-16x49x98	} Flange Steel.
1 $\frac{1}{4}$ x 96 x 98	
2 Hds. 34 dia. x 5-16 or $\frac{3}{8}$	

Shell, 36 in. dia. x 8 ft. long

2 Sh'ts $\frac{1}{4}$ or 5-16x49x118	} Flange Steel.
1 $\frac{1}{4}$ 5-16x96x118	
2 Hds. 40 dia. x 5-16, $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Shell, 36 in. dia. x 10 ft. long

2 Sh'ts $\frac{1}{4}$, 5-16 or $\frac{3}{8}$ x60x120	} Flange Steel.
2 Hds. 40 dia. x 5-16, $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Shell, 42 in. dia. x 10 ft. long

2 Sh'ts $\frac{1}{4}$ or 5-16x60x138	} Flange Steel.
2 Hds. 46 dia. x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Shell, 42 in. dia. x 12 ft. long

3 Sh'ts $\frac{1}{4}$ or 5-16x49 x138	} Flange Steel.
2 $\frac{1}{4}$ 5-16x72 $\frac{1}{2}$ x138	
2 Hds. 46 dia. x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Shell, 42 in. dia. x 14 ft. long

3 Sh'ts $\frac{1}{4}$ or 5-16x57x138	} Flange Steel.
2 $\frac{1}{4}$ 5-16x84x138	
2 Hds. 46 dia. x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Shell, 42 in. dia. x 16 ft. long

4 Sh'ts $\frac{1}{4}$ or 5-16x49 x138	} Flange Steel.
3 $\frac{1}{4}$ 5-16x64 $\frac{3}{4}$ x138	
2 $\frac{1}{4}$ 5-16x95 $\frac{1}{2}$ x138	
2 Hds. 46 dia. x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Shell, 44 in. dia. x 12 ft. long

3 Sh'ts $\frac{1}{4}$ or 5-16x49 x143	} Flange Steel.
2 $\frac{1}{4}$ 5-16x72 $\frac{1}{2}$ x143	
2 Hds. 48 dia. x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Shell, 44 in. dia. x 14 ft. long

3 Sh'ts $\frac{1}{4}$ or 5-16x57 x143	} Flange Steel.
2 $\frac{1}{4}$ 5-16x84 $\frac{3}{4}$ x143	
2 Hds. 48 dia. x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Shell, 48 in. dia. x 12 ft. long

6 Sh'ts 5-16 x 49 x 80	} Flange Steel.
3 $\frac{1}{4}$ or 5-16x49 x156	
2 $\frac{1}{4}$ 5-16x72 $\frac{1}{2}$ x156	
2 Hds. 52 $\frac{1}{2}$ dia. x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	

Dome Plates, Steam and Mud Drum Plates, Boiler Tubes, Rivets, Braces, Pressed Steel Lugs, and Wrought Steel Flanges furnished with above as ordered.

STOCK BOILERS—Continued.**Shell, 48 in. dia. x 14 ft. long**

3 Sh'ts	$\frac{3}{4}$ or 5-16 x 57	x 156	} Flange
2	$\frac{3}{4}$ or 5-16 x 84 $\frac{1}{2}$	x 156	
2 Hds.	52 $\frac{1}{2}$ dia.	x $\frac{3}{8}$, 7-16	
	or $\frac{1}{2}$		} Steel.

Shell, 48 in. dia. x 16 ft. long

4 Sh'ts	$\frac{3}{4}$ or 5-16 x 49	x 156	} Flange
3	$\frac{3}{4}$	5-16 x 64 $\frac{3}{4}$ x 156	
2	$\frac{3}{4}$	5-16 x 95 $\frac{1}{2}$ x 156	
2 Hds.	52 $\frac{1}{2}$ dia.	x $\frac{3}{8}$, 7-16	} Steel.
	or $\frac{1}{2}$		

Shell, 48 in. dia. x 18 ft. long

3 Sh'ts	$\frac{3}{4}$ or 5-16 x 72 $\frac{1}{2}$	x 156	} Flange
2 Hds.	52 $\frac{1}{2}$ dia.	x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	
			} Steel.

Shell, 54 in. dia. x 14 ft. long

6 Sh'ts	5-16 x 57	x 90	} Flange
3	5-16 x 57	x 175	
2	5-16 x 84 $\frac{1}{2}$	x 175	
2 Hds.	58 $\frac{1}{2}$ dia.	x $\frac{3}{8}$, 7-16	
	or $\frac{1}{2}$		} Steel.

Shell, 54 in. dia. x 16 ft. long

6 Sh'ts	5-16 x 64 $\frac{3}{4}$	x 90	} Flange
3	5-16 x 64 $\frac{3}{4}$	x 175	
2	5-16 x 95 $\frac{1}{2}$	x 175	
2 Hds.	58 $\frac{1}{2}$ dia.	x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	
			} Steel.

Shell, 54 in. dia. x 18 ft. long

3 Sh'ts	5-16 x 72 $\frac{1}{2}$	x 175	} Flange
2 Hds.	58 $\frac{1}{2}$ dia.	x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	
			} Steel.

Shell, 60 in. dia. x 12 ft. long

6 Sh'ts	5-16 x 49	x 99	} Flange
3	5-16 x 49	x 194	
2	5-16 x 72 $\frac{1}{2}$	x 194	
2 Hds.	65 dia.	x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	} Steel.

Shell, 60 in. dia. x 14 ft. long

6 Sh'ts	5-16 x 57	x 99	} Flange
3	5-16 x 57	x 194	
2	5-16 x 84 $\frac{1}{2}$	x 194	
2 Hds.	65 dia.	x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	} Steel.

Shell, 60 in. dia. x 16 ft. long

6 Sh'ts	5-16 or $\frac{3}{8}$ x 64 $\frac{3}{4}$	x 99	} Flange
3	5-16	$\frac{3}{8}$ x 64 $\frac{3}{4}$ x 194	
2	5-16	$\frac{3}{8}$ x 95 $\frac{1}{2}$ x 194	
2 Hds.	65 dia.	x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	} Steel.

Shell, 60 in. dia. x 18 ft. long

6 Sh'ts	5-16 or $\frac{3}{8}$ x 72 $\frac{1}{2}$	x 99	} Flange
3	5-16	$\frac{3}{8}$ x 72 $\frac{1}{2}$ x 194	
2	5-16	$\frac{3}{8}$ x 107 $\frac{1}{2}$ x 194	
2 Hds.	65 dia.	x $\frac{3}{8}$, 7-16 or $\frac{1}{2}$	} Steel.

Shell, 66 in. dia. x 16 ft. long

6 Sh'ts	$\frac{3}{8}$ x 64 $\frac{3}{4}$	x 108	} Flange
3	$\frac{3}{8}$ x 64 $\frac{3}{4}$	x 212 $\frac{1}{2}$	
2	$\frac{3}{8}$ x 95 $\frac{1}{2}$	x 212 $\frac{1}{2}$	
2 Hds.	71 dia.	x $\frac{1}{2}$ or $\frac{3}{8}$	
			} Steel.

Shell, 66 in. dia. x 18 ft. long

6 Sh'ts	$\frac{3}{8}$ x 72 $\frac{1}{2}$	x 108	} Flange
3	$\frac{3}{8}$ x 72 $\frac{1}{2}$	x 212 $\frac{1}{2}$	
2	$\frac{3}{8}$ x 107 $\frac{1}{2}$	x 212 $\frac{1}{2}$	
2 Hds.	71 dia.	x $\frac{1}{2}$ or $\frac{3}{8}$	
			} Steel.

Shell, 72 in. dia. x 16 ft. long

6 Sh'ts	$\frac{3}{8}$ x 64 $\frac{3}{4}$	x 118	} Flange
3	$\frac{3}{8}$ x 64 $\frac{3}{4}$	x 232 $\frac{1}{2}$	
2	$\frac{3}{8}$ x 95 $\frac{1}{2}$	x 232 $\frac{1}{2}$	
2 Hds.	77 dia.	x $\frac{1}{2}$ or $\frac{3}{8}$	
			} Steel.

Shell, 72 in. dia. x 18 ft. long

6 Sh'ts	$\frac{3}{8}$ x 72 $\frac{1}{2}$	x 118	} Flange
3	$\frac{3}{8}$ x 72 $\frac{1}{2}$	x 232 $\frac{1}{2}$	
2	$\frac{3}{8}$ x 107 $\frac{1}{2}$	x 232 $\frac{1}{2}$	
2 Hds.	77 dia.	x $\frac{1}{2}$ or $\frac{3}{8}$	
			} Steel.

Dome Plates, Steam and Mud Drum Plates, Boiler Tubes, Rivets, Braces, Pressed Steel Lugs and Wrought Steel Flanges furnished with above as ordered.

STANDARD STEAM BOILER MEASUREMENTS

Based on 12 square feet of heating surface to a horse power.

Size.		Thick- ness.		Size of Dome.	Boiler with Hand Holes.				Boiler with Man Holes.			
Dia.	Length	Shell.	Heads.		Tubes.		Heat Surf. sq. ft.	Horse Power.	Tubes.		Heat. Surf. sq. ft.	Horse Power.
					No.	Dia.			No.	Dia.		
30	6	$\frac{3}{4}$	$\frac{3}{8}$	16 x 20	19	$2\frac{1}{2}$	106	9				
30	8	$\frac{3}{4}$	$\frac{3}{8}$	16 x 20	19	$2\frac{1}{2}$	141	12				
					38	$2\frac{1}{2}$	256	21				
36	8	$\frac{3}{4}$	$\frac{3}{8}$	18 x 20	28	3	226	19				
					25	$3\frac{1}{2}$	234	20				
					38	$2\frac{1}{2}$	311	26				
36	10	$\frac{3}{4}$	$\frac{3}{8}$	18 x 20	28	3	283	24				
					25	$3\frac{1}{2}$	292	24				
42	10	$\frac{3}{4}$	$\frac{3}{8}$	20 x 24	38	3	372	31				
					34	$3\frac{1}{2}$	385	32				
42	12	$\frac{3}{4}$	$\frac{3}{8}$	20 x 24	38	3	446	37				
					34	$3\frac{1}{2}$	462	39				
42	14	$\frac{3}{4}$	$\frac{3}{8}$	20 x 24	38	3	520	43				
					34	$3\frac{1}{2}$	539	45				
42	16	$\frac{3}{4}$	$\frac{3}{8}$	20 x 24	38	3	595	50				
					34	$3\frac{1}{2}$	616	51				
44	12	$\frac{3}{4}$	$\frac{3}{8}$	24 x 24	48	3	544	45				
					38	$3\frac{1}{2}$	510	43				
44	14	$\frac{3}{4}$	$\frac{3}{8}$	24 x 24	48	3	635	53				
					38	$3\frac{1}{2}$	491	41				
48	12	$\frac{5}{16}$	$\frac{7}{16}$	24 x 24	58	3	647	54	50	3	572	48
					50	$3\frac{1}{2}$	651	54	34	$3\frac{1}{2}$	475	40
48	14	$\frac{5}{16}$	$\frac{7}{16}$	24 x 24	58	3	755	63	50	3	667	55
					50	$3\frac{1}{2}$	759	63	34	$3\frac{1}{2}$	547	46
48	16	$\frac{5}{16}$	$\frac{7}{16}$	24 x 24	58	3	862	72	50	3	762	64
					50	$3\frac{1}{2}$	867	72	34	$3\frac{1}{2}$	633	53
48	18	$\frac{5}{16}$	$\frac{7}{16}$	24 x 24	58	3	970	81	50	3	857	71
					50	$3\frac{1}{2}$	976	81	34	$3\frac{1}{2}$	712	59
					71	3	912	76	59	3	780	65
54	14	$\frac{5}{16}$	$\frac{1}{2}$	30 x 30	56	$3\frac{1}{2}$	851	71	48	$3\frac{1}{2}$	748	62
					43	4	763	64	40	4	719	60
					71	3	1042	87	59	3	891	74
54	16	$\frac{5}{16}$	$\frac{1}{2}$	30 x 30	56	$3\frac{1}{2}$	972	81	48	$3\frac{1}{2}$	855	71
					43	4	802	67	40	4	821	68
54	18	$\frac{5}{16}$	$\frac{1}{2}$	30 x 30	71	3	1173	98	59	3	1003	84
					56	$3\frac{1}{2}$	1094	91	48	$3\frac{1}{2}$	962	80
					43	4	980	82	40	4	924	77
60	12	$\frac{5}{16}$	$\frac{1}{2}$	36 x 36	71	$3\frac{1}{2}$	907	75	56	$3\frac{1}{2}$	742	62
					54	4	804	67	46	4	704	59
					43	$4\frac{1}{2}$	733	61	36	$4\frac{1}{2}$	634	53
60	14	$\frac{5}{16}$	$\frac{1}{2}$	36 x 36	71	$3\frac{1}{2}$	1058	88	56	$3\frac{1}{2}$	865	72
					54	4	938	78	46	4	821	68
					43	$4\frac{1}{2}$	855	71	36	$4\frac{1}{2}$	740	62
60	16	$\frac{5}{16}$	$\frac{1}{2}$	36 x 36	71	$3\frac{1}{2}$	1209	101	56	$3\frac{1}{2}$	989	82
					54	4	1073	89	46	4	939	78
					43	$4\frac{1}{2}$	978	82	36	$4\frac{1}{2}$	846	71
60	18	$\frac{5}{16}$	$\frac{1}{2}$	36 x 36	71	$3\frac{1}{2}$	1360	113	56	$3\frac{1}{2}$	1113	93
					54	4	1207	101	46	4	1056	88
					43	$4\frac{1}{2}$	1100	92	36	$4\frac{1}{2}$	952	79
66	16	$\frac{3}{8}$	$\frac{1}{2}$	40 x 40	90	$3\frac{1}{2}$	1504	125	84	$3\frac{1}{2}$	1416	118
					68	4	1324	110	56	4	1122	94
					56	$4\frac{1}{2}$	1239	103	46	$4\frac{1}{2}$	1051	88
66	18	$\frac{3}{8}$	$\frac{1}{2}$	40 x 40	90	$3\frac{1}{2}$	1692	141	84	$3\frac{1}{2}$	1593	133
					68	4	1489	124	56	4	1263	105
					56	$4\frac{1}{2}$	1394	116	46	$4\frac{1}{2}$	1113	93
72	16	$\frac{3}{8}$	$\frac{1}{2}$	42 x 42	108	$3\frac{1}{2}$	1785	149	98	$3\frac{1}{2}$	1638	137
					82	4	1575	131	72	4	1407	117
					64	$4\frac{1}{2}$	1407	117	60	$4\frac{1}{2}$	1331	111
72	18	$\frac{3}{8}$	$\frac{1}{2}$	42 x 42	108	$3\frac{1}{2}$	2008	167	98	$3\frac{1}{2}$	1843	154
					82	4	1772	148	72	4	1584	132
					64	$4\frac{1}{2}$	1583	132	60	$4\frac{1}{2}$	1498	125

The above table is based on rule for ascertaining Heating Surface as shown on inside of back cover of Stock List.

